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December 1998

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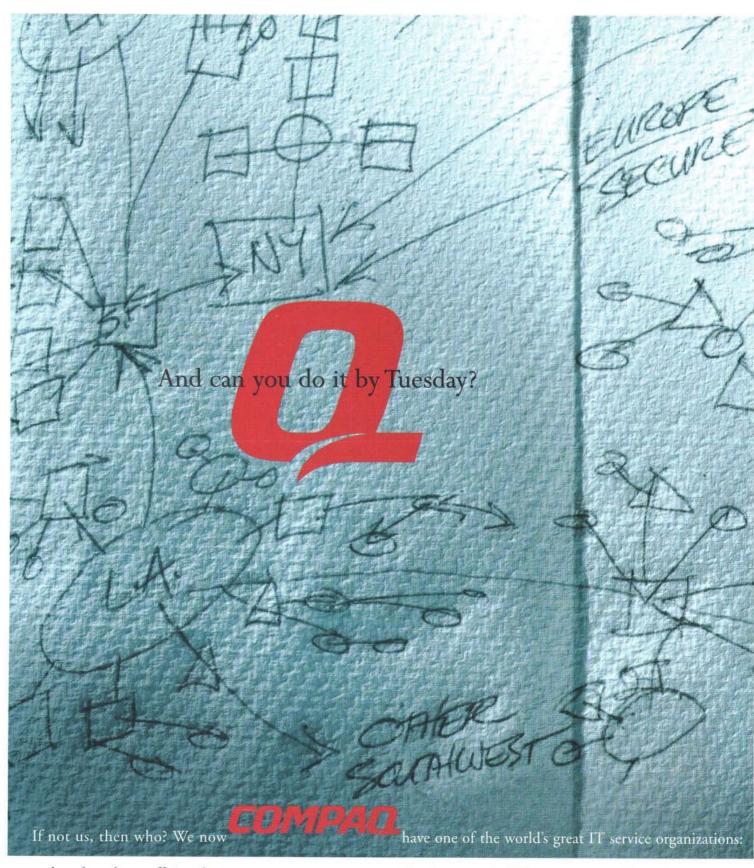
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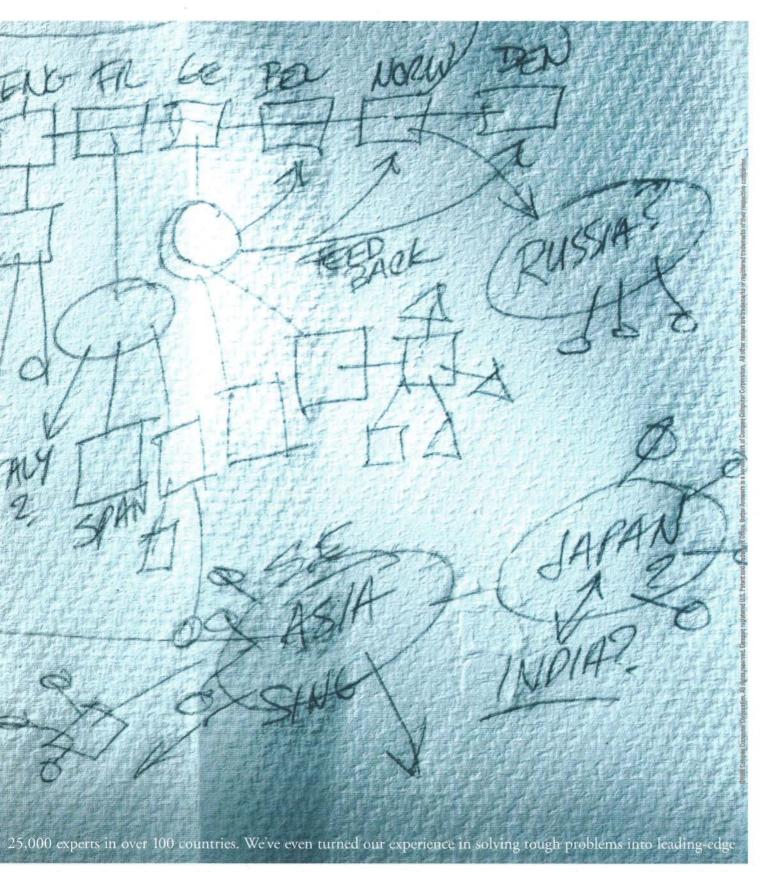
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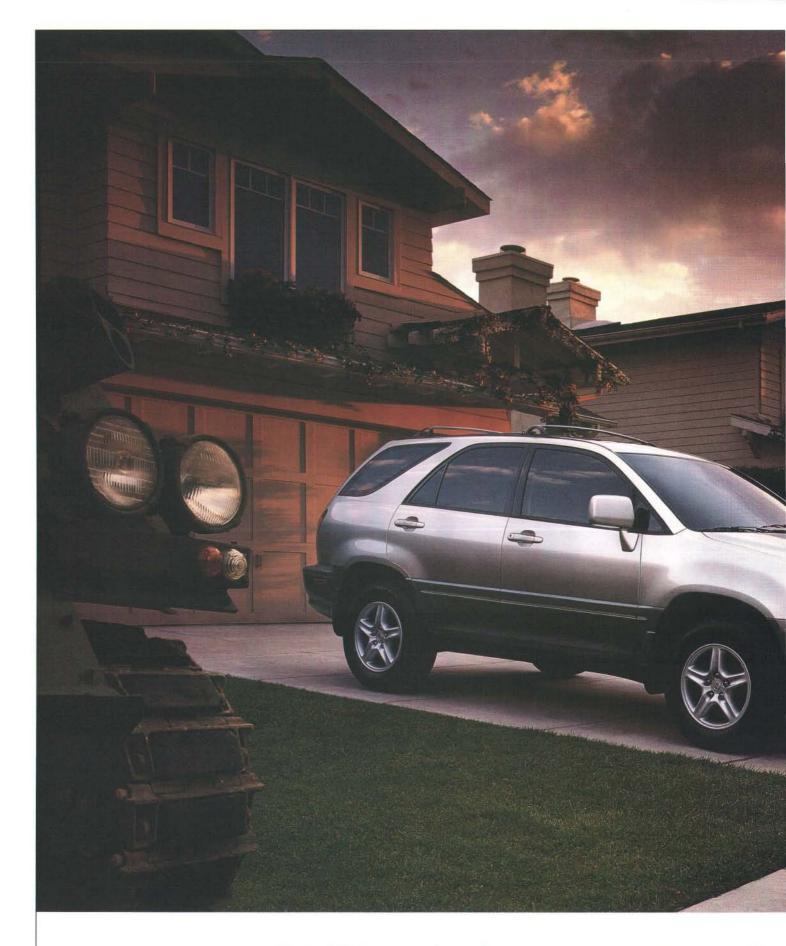


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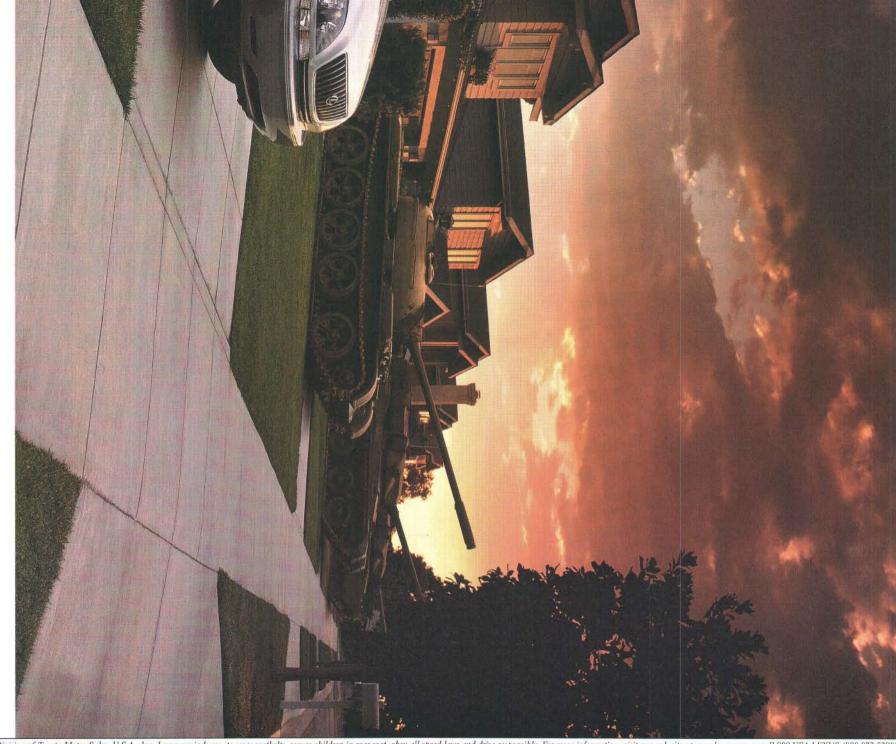
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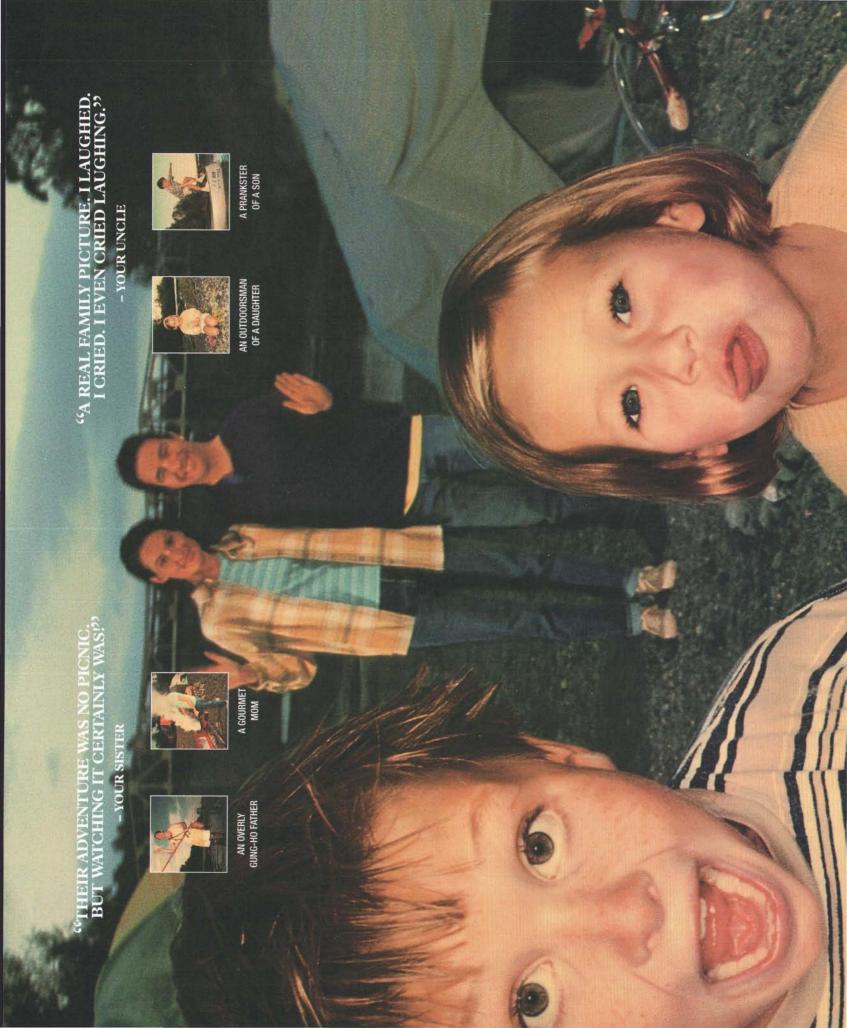
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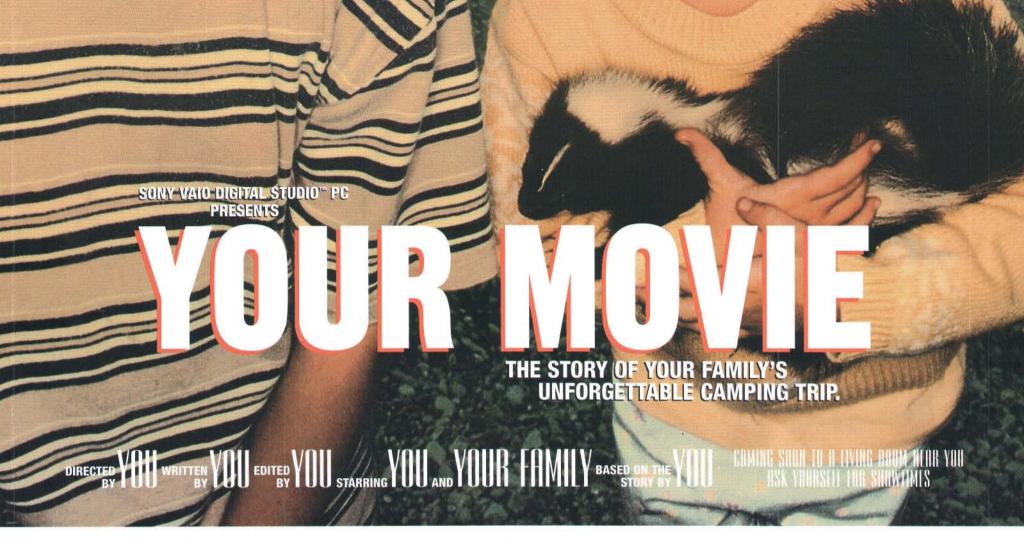


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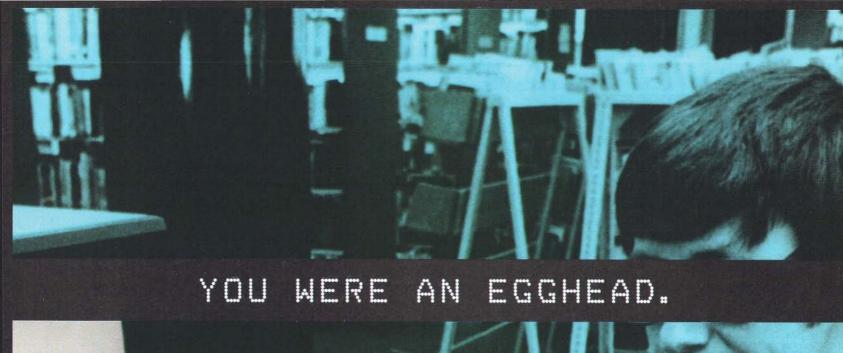
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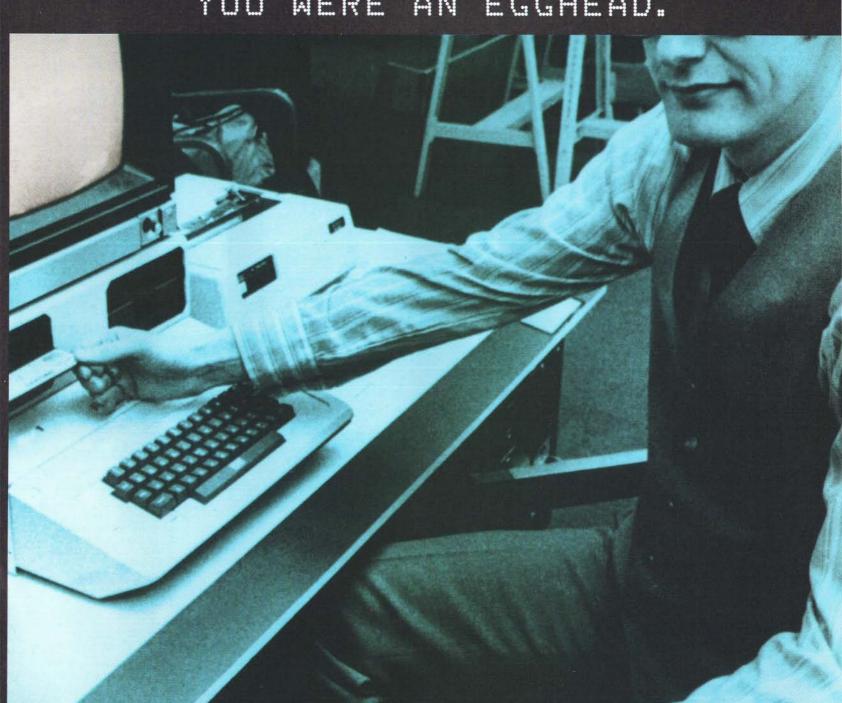
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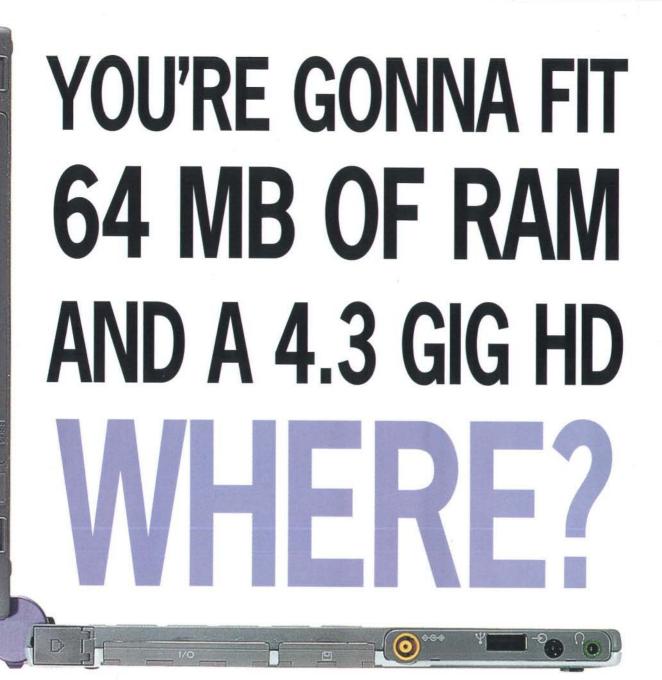




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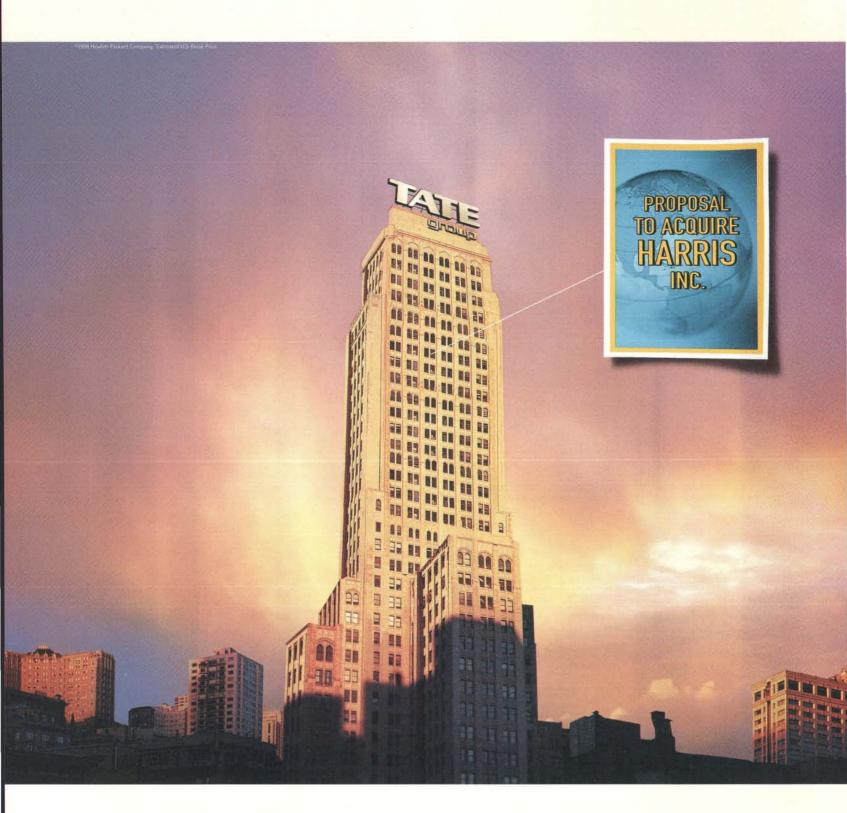
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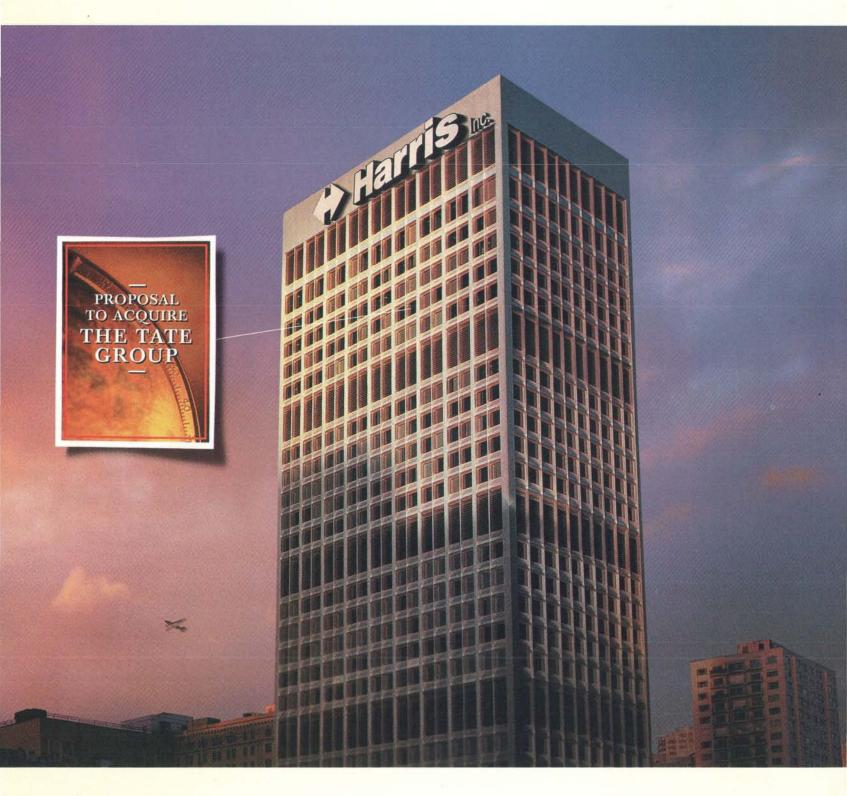


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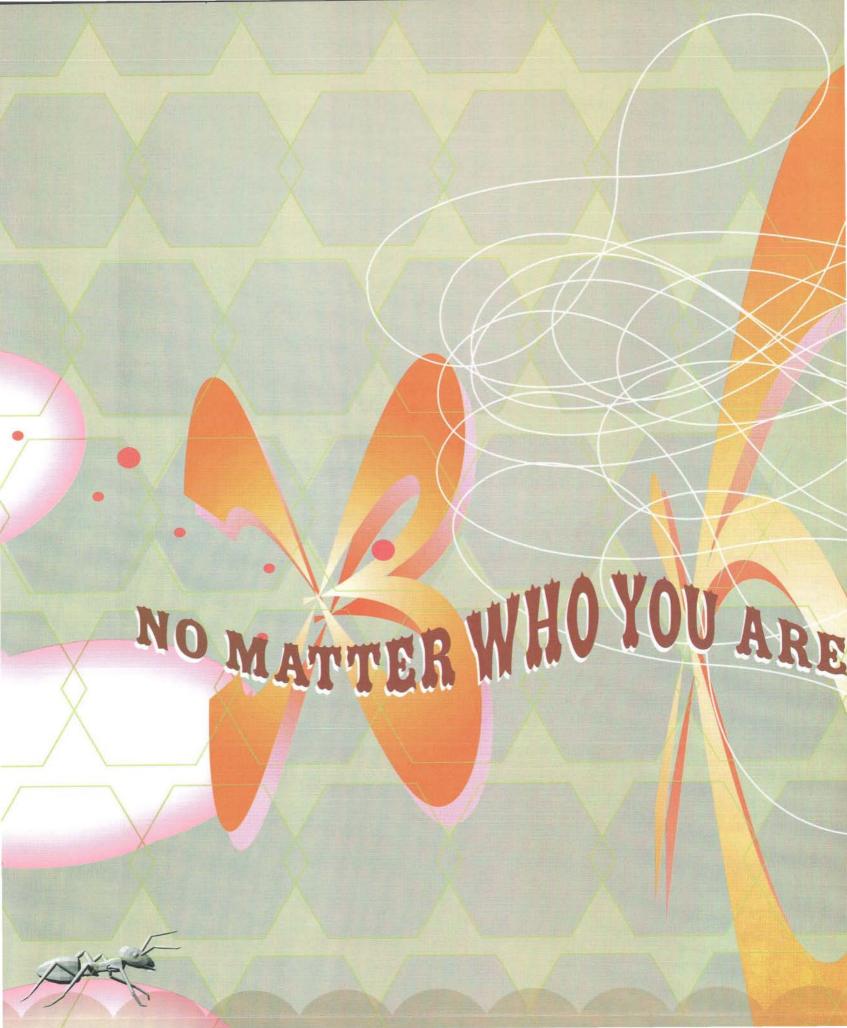
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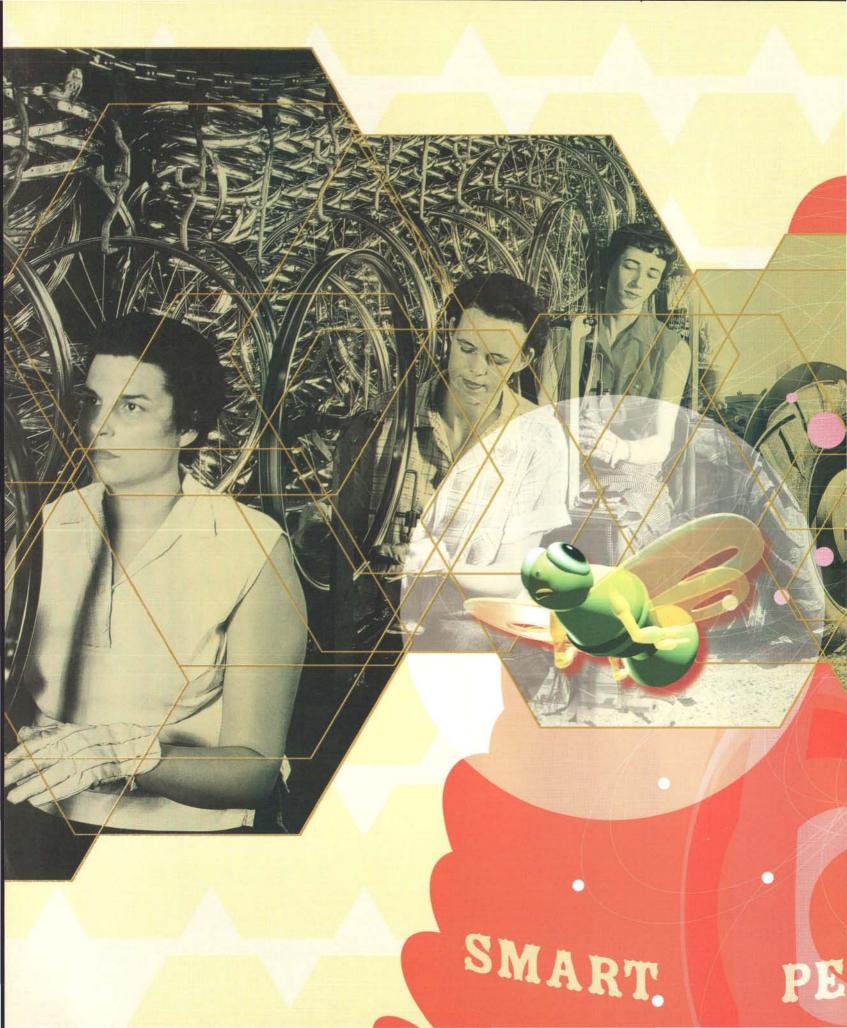




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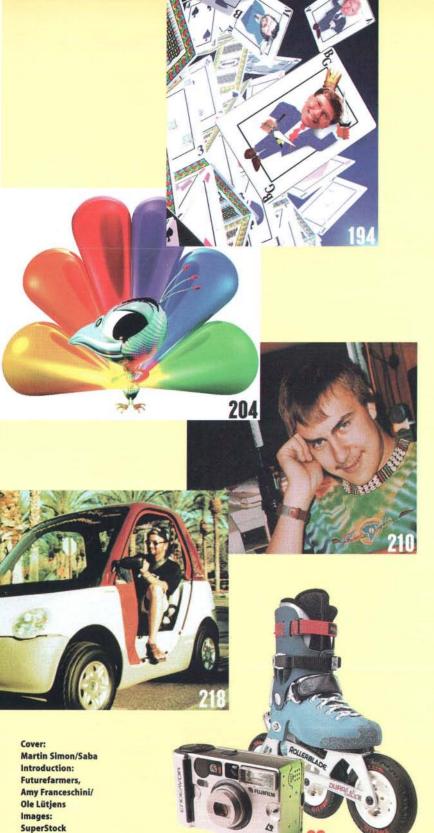
BILL JOY, IN "83 REASONS WHY BILL GATES'S REIGN IS OVER," PAGE 194 MOST OF THE SMARTEST PEOPLE WORK FOR SOMEONE ELSE.

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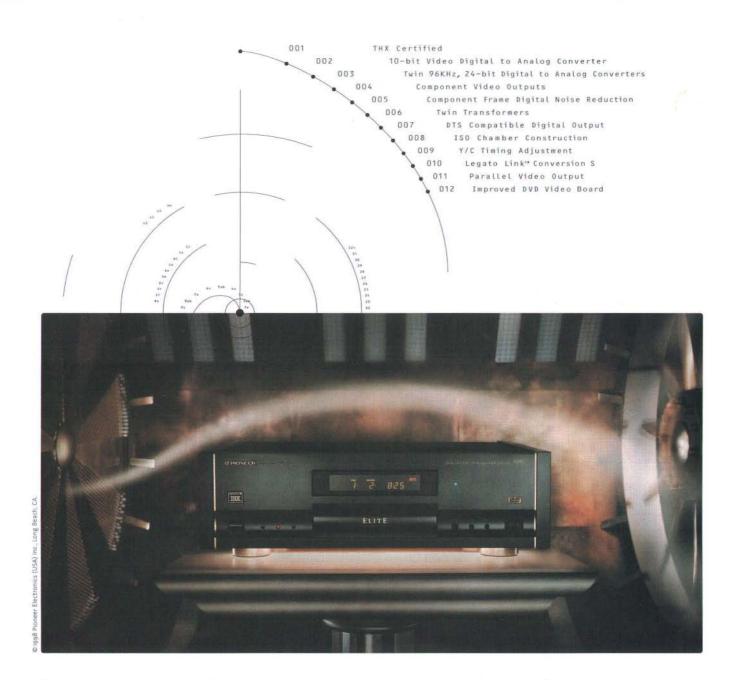
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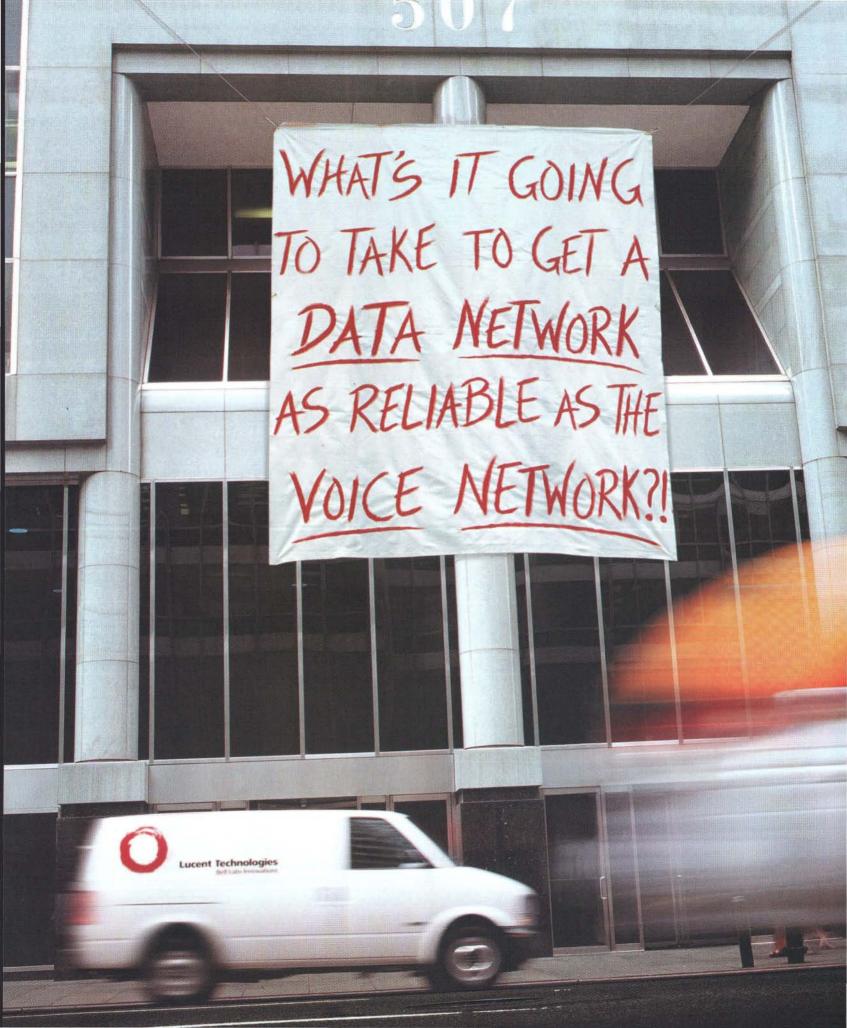
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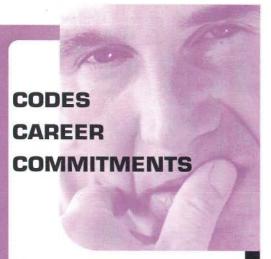




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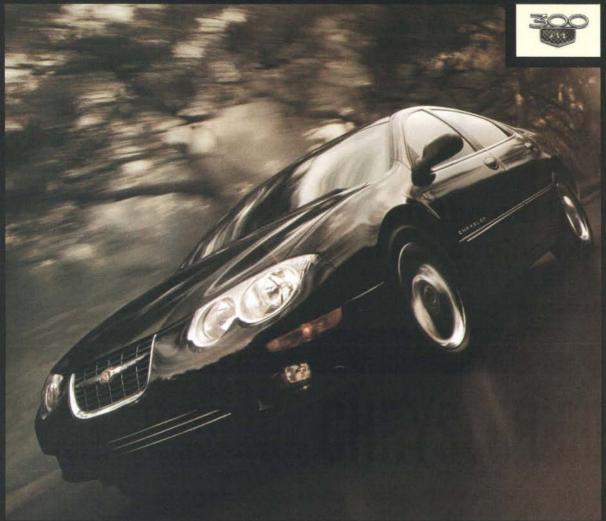


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# RANTS & RAVES

#### The Good Ol' Days

I loved David Bennahum's "When We Were Young" (*Wired* 6.09, page 128). I'm 16, and I started programming about eight years ago when my dad showed me how to use our old Atari to do my math homework by writing a simple Basic program. I missed out on the beginning of the computer era, but I remember the good ol' days when CLS cleared the screen. Now using Microsoft Visual C++, it takes a 60-line subroutine. I remember when typing in a verb — PRINT, RUN, END — made the computer do just that. Now, I have to pull out an 800-page book that cost \$70 to find out what member functions of what class to call to make the SDK use MFC to tell OS to do something on the GUI. I remember when compiling programs didn't mean leaving your computer running overnight.

Nevertheless, I know that there is a future generation of programmers. (And if I'm wrong, that just means I'll make more money.) AP Comp Science is in now taught in almost every high school and, starting this month, features C++ instead of Pascal.

Robert G. Levy csc@exis.net

#### Size Matters

The two fine articles in *Wired* 6.09 that covered computer history over some 20 years — "The World According to Woz"

and "When We Were Young" – bring back memories of simpler and happier days. It was nice to be able to program in Basic.

The question "Why drive people to bigger and faster computers, taking advantage of their technological insecurity, when basic computing needs were so simple?" can be answered by going to any bookstore and seeing the row upon row of books that "help" solve the intricacies of today's bloatware. Or look at the local adult-education courses that "help" you master today's computer programs. Is bigger really better? For whom?

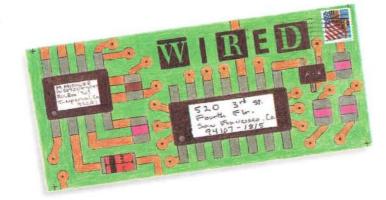
Conrad Weiler Conrad17@aol.com

Sendable circuit board: Mike Mishler, pen and colored pencils.

## A Gaggle of Wozzes

Kudos for "The World According to Woz" (Wired 6.09, page 118). As befits a man of endless facility and good humor, Woz's squiring a gaggle of young folks into the world of PCs tells me he's training the next crop of Wozzes! We need as many as we can get, to say nothing of an attitude shift on the part of many adults. The kids will be here a lot longer than we will, and they need to be prepared. Bravo, Woz.

Ken Egbert New York



# **Posting Results**

In spite of the Godzilla-versus-Bambi polarity you suggest between John Doerr and Herb Kohl, they seem to be saying the same thing ("Smart Kids? Who Needs 'Em," Wired 6.09, page 122). We all consume education, we need better information about what schools are doing, and schools and the public officials who oversee them should be held accountable for our future.

For Kohl, a single test-score average reveals as little as a single quarterly earnings report might for Doerr; for Doerr, any report is better than no report. A test score is fine, but the truth of a student's product is the product itself. The Internet is the perfect medium to portray school differences — real portfolios of student work can be posted for everybody to see and evaluate. Why use a single measure of achievement when you can look at the whole package?

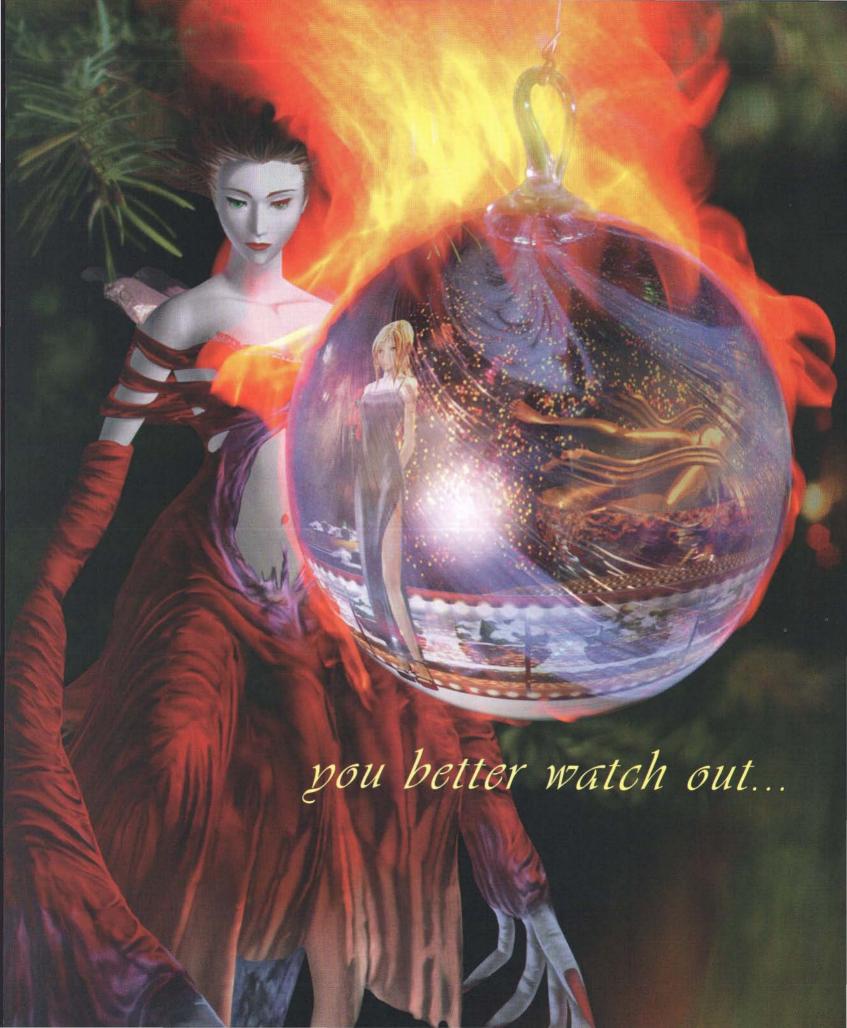
Joe Beckmann joeb@oekos.org

# English 2.0

To record the poetry of a dying friend, Steven Gulie searches for a medium (and the hardware to read it) that will endure into the future ("Saved," Wired 6.09, page 98). He laments that all recording media have limited life spans, not only because of physical decay, but also because of the advance of technology, which brings rapid obsolescence. Yet there is an additional reason for pessimism.

Consider the prolog to Chaucer's Canterbury Tales. The vernacular English of 600 years ago is virtually unintelligible. In 600 years, today's English will be similarly unintelligible. The Oxford English Dictionary, arguably the ultimate arbiter of acceptable English, now accepts any word that has achieved widespread use, regardless of etymological or grammatical considerations. Hence, not only do we need to retranscribe the entirety of our archives onto each new recording medium, we also need to include all the changes that have occurred since each item was originally recorded - a daunting task.

Peter M. Ronai pmronai@open.org



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# RANTS & RAVES

## Southern Envy

**Northern Envy** 

I was rather surprised to see

you omit Silicon Valley North,

the suburbs west of Ottawa.

Home to Mitel, Cognos, Corel,

Marconi, a major DEC facility,

and Northern Telecom, among

many others, SVN is growing

quickly - Nortel alone is add-

ing 5,000 employees at new

mschind@connect.ab.ca

campuses in the Ottawa

Marc A. Schindler

region.

Spar Aerospace, Canadian

Allow me to contribute another name to the Silicon Envy list ("Silicon Envy," Wired 6.09, page 136): Silicon Valley South in Guadalajara, Mexico. It has been growing right under your noses since the 1970s, when the first electronics factories were established, and now represents a \$7 billion industry for contract manufacturers and electronics-related companies. Major players include Philips, Motorola, Siemens, IBM, Hewlett-Packard, Kodak, NEC, SCI Systems, Solectron, Flextronics, and others.

This area thrives thanks to NAFTA, a highly skilled labor force, plenty of local professionals, strong sup-

port services, and geographical proximity to the real thing (three hours by plane to Silicon Valley). Maybe the only thing it lacks is a governmentsponsored, white-elephant-type megaproject.

Gustavo Aragon gusaragon@vinet.com.mx

#### Sell Your MTV

September 2002: Two years ago I read James Surowiecki's "Gold into Led" (Wired 6.09, page 77), and my tensions were calmed over the Led Zeppelin (ESX: LZEP) bond crash. Instead of unloading my stake in LZEP, I balanced my ABSes in other

entertainment issues. I decided to buy up shares of Marilyn Manson (ESDAQ: MNSN) and Creed (ESX: CRD) instead of investing in the stable portal market. Since then, I have seen my portfolio sustain healthy growth. Luckily, I had already dumped my Hanson shares (ESX: HNS).

Surowiecki's mention of MTVfn harkened back to its heyday of cutting-edge financial reporting. Of course, this was before it got caught up with all those episodes of *The Real World of Stockbrokers*.

Tom Peditto tpeditto@mindspring.com

#### **Crazy for Furby**

Scott Kirsner's wonderfully rich overview of the toy industry was coolly dispassionate, and the birth of Furby was cleverly interwoven to provide an exciting tale ("Moody Furballs and the Developers Who Love

Them," Wired 6.09, page 138). Kirsner wisely leaves the human issue up to us. How do we protect our children from this juggernaut? Some of us don't want our kids collecting Furbies at \$30 a pop. Spider Robinson says that these are the crazy years. This is certainly one crazy industry. Obviously, a lot of us must be crazy to support it.

Bill Dunlop wadskh@compuserve.com

# **Merely Coincidence**

The pain has finally ended. The Wired Investment Portfolio short position in Yahoo! was finally closed out for a modest loss of only 157 percent ("Big Is Beautiful," Wired 6.09, page 176). Did anybody else notice the high correlation between the price of Yahoo! stock each month and the page on which the portfolio appeared in the magazine? As the stock rose and rose (and losses mounted), so did the page number. But that's understandable — I wouldn't want to show off that performance, either.

Eric Evans emailevans@yahoo.com

## Lessons from the Underground

Thank you for Kingpin's article "Happy Hacking" (Wired 6.09, page 143). It isn't often that the underground goes mainstream. For the most part, I don't believe it should, but in this case it gives the public a good view of what goes on there. I am familiar with the computer underground, and I suppose the thing that fuels many hackers is the suppressed desire for recognition. LOpht is a great place to get inspiration — perhaps by pointing this out, some kids will become interested and expand their creative genius. The world could use another Woz or three.

Electrik Monk monk@fromedome.com

## **Modern-Day Nomads**

Pico lyer's obvious enthusiasm for his subject must be clouding his vision ("Jet-Age Bedouins," Wired 6.08, page 103). He claims not to have had a place of his own for almost 10 years, but shuttling back and forth between his mother's house and his girlfriend's apartment is no comparison to the snail, which carries its house on its back, or to the Konjo people of Indonesia and their portable stilt shelters. The word most people use for his type of lifestyle is "freeloading." This kind of jet-age, neotribal lifestyle is already surprisingly popular among postadolescent males who haven't yet learned how to cook or iron.

lan Warner robotnik@snafu.de

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#### Undo

For Which It Stands: In 1999 Australians will vote on whether Australia should become a republic; whatever the result, the country will remain a member of the Commonwealth ("Hit the Road, Union Jack," Wired 6.08, page 88).

In a past life I was a fir tree. One day somebody chopped me down and covered me with decorations. Next thing I knew, they threw me back outside. I remember thinking," What was that all about?"



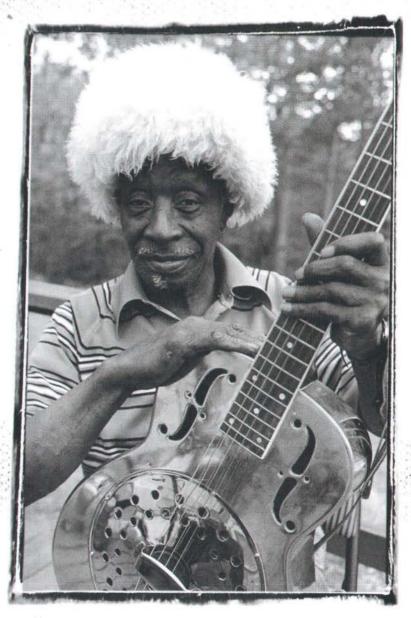
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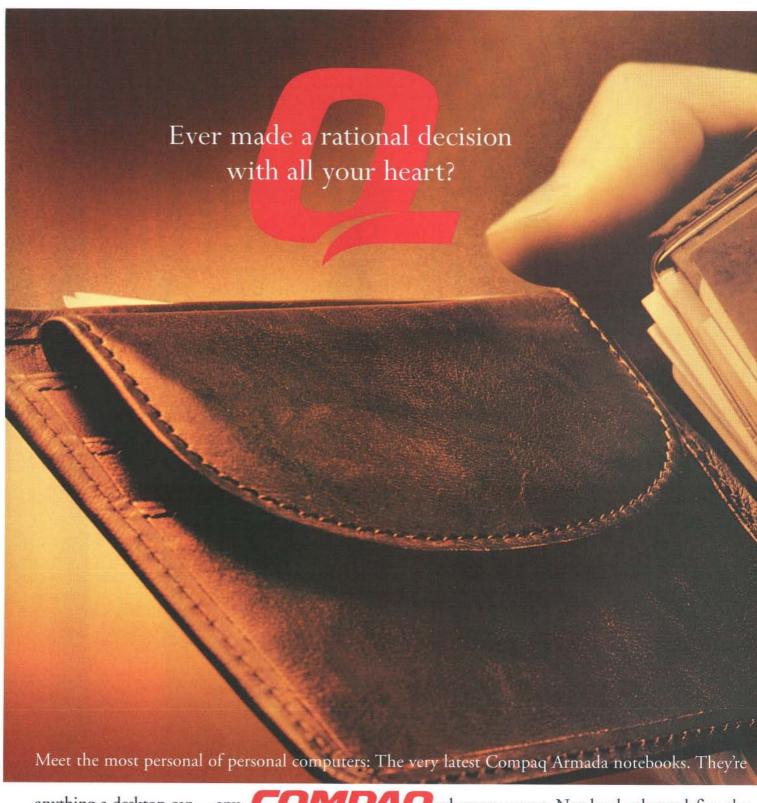
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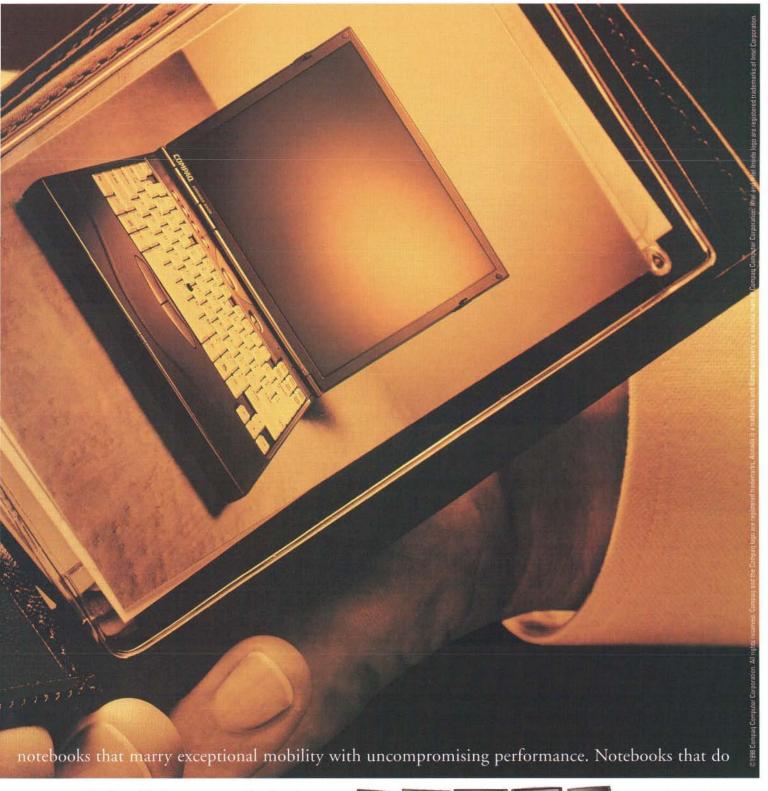
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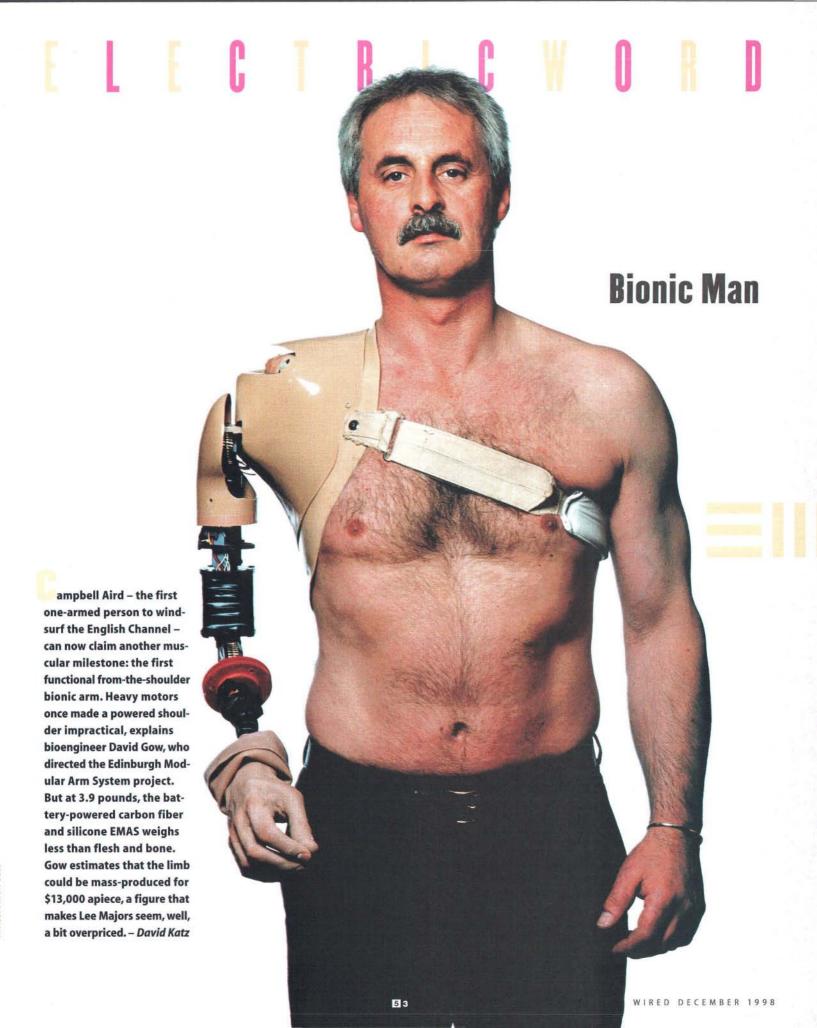
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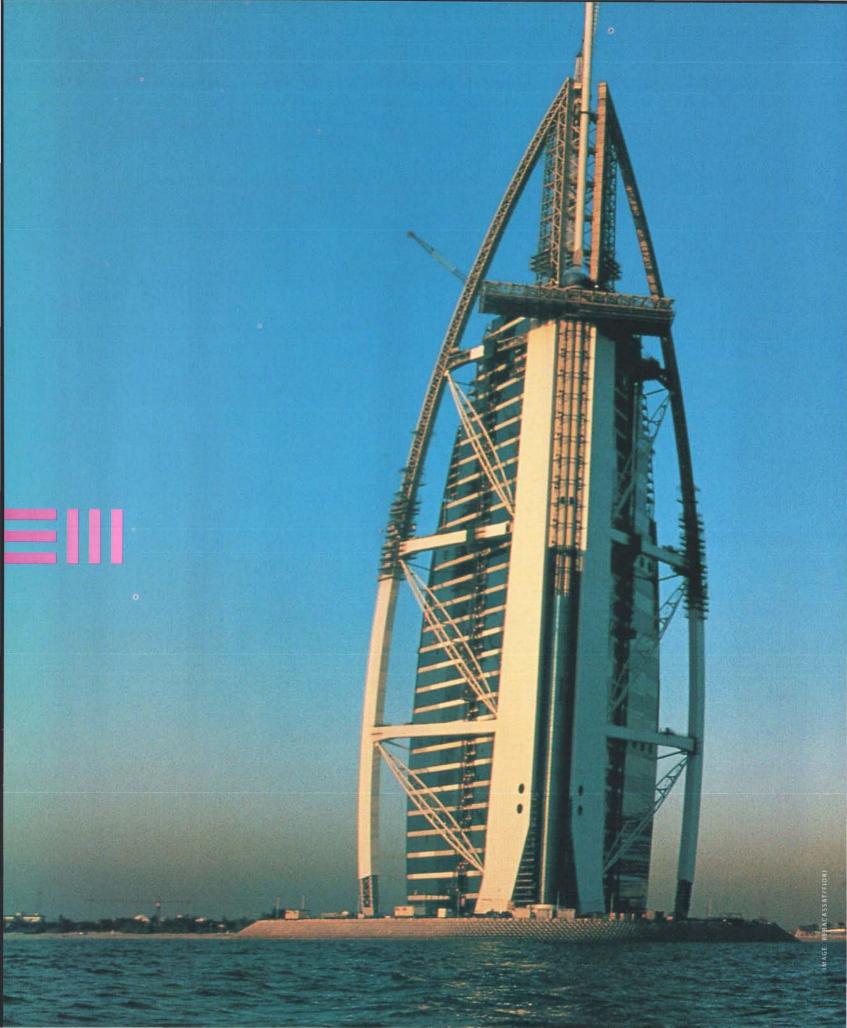
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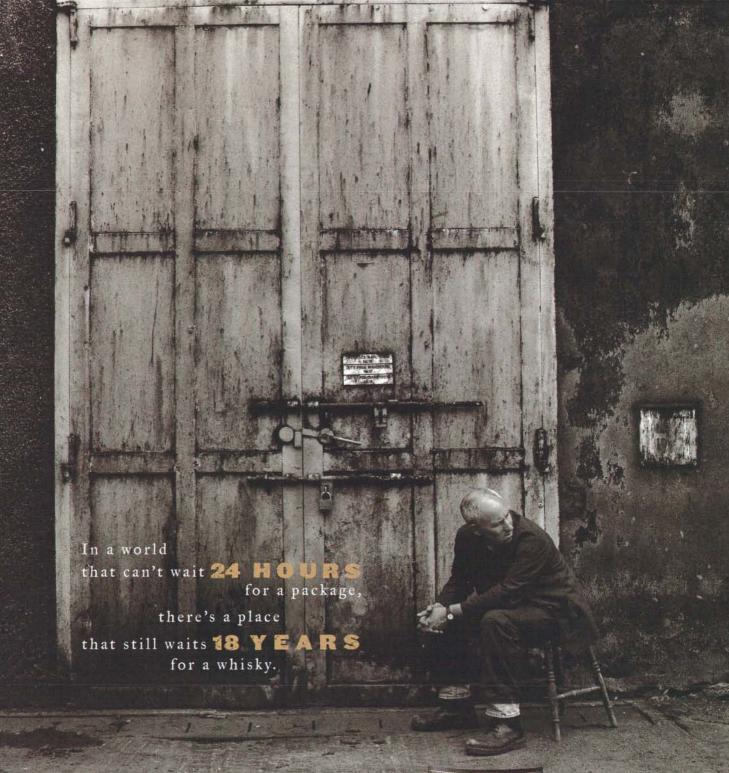


# Trés Sheikh

n a quiet pocket of the Arabian Peninsula, a global business hub is rising: Dubai. Trying to convert this taxfree haven into an upscale tourist mecca, Dubai's crown prince, Sheikh Muhammad bin Rashid Al-Maktoum, is developing a lonely stretch of beach into a Middle Eastern Côte d'Azur. The jewel is Sheikh Muhammad's new fivestar, 321-meter-high Tower Hotel, which surges upward offshore. Featuring 200 suites equipped with digital television, Net access, and sunken marble bathtubs, the hotel will be the tallest in the world upon its completion by 2000. - Catharine Lo

# Bit Biter

opper, the ravenous villain of the big-screen A Bug's Life, eats CPU power as voraciously as his real-world analog devours crops. At Pixar's render farm, where 84 workstations crunched code round the clock, it took 24 hours to produce one second of this bug's life. William Reeves, a technical director, attributes the complexity to the almost 4,000 controls used for Hopper's movement, shading, and gestures. To create subtle facial expressions that match Kevin Spacey's voice, Reeves's team turned to subdivisional surfaces, a 3-D technology making its feature début. Though the body performs the action, Reeves says, "it's the face you feel." - Tom Claburn



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# **Autodidact**

s creator of the Fabulous Ruins of Detroit (www.bhere.com/ruins /home.htm), amateur historian Lowell Boileau is driven to save one of the Motor City's most-endangered landmarks - the factory where Henry Ford built the first Model T in 1908. Threatened with demolition, the 67,500square-foot structure at the corner of Beaubien and Piquette can be had for \$300,000 - a bargain, considering Ford built it for just under \$100,000. "This is the womb of the modern automobile industry," says Boileau. "The Model T did for cars what the \$900 PC has done for computers - it made the automobile an affordable commodity." - Todd Lappin

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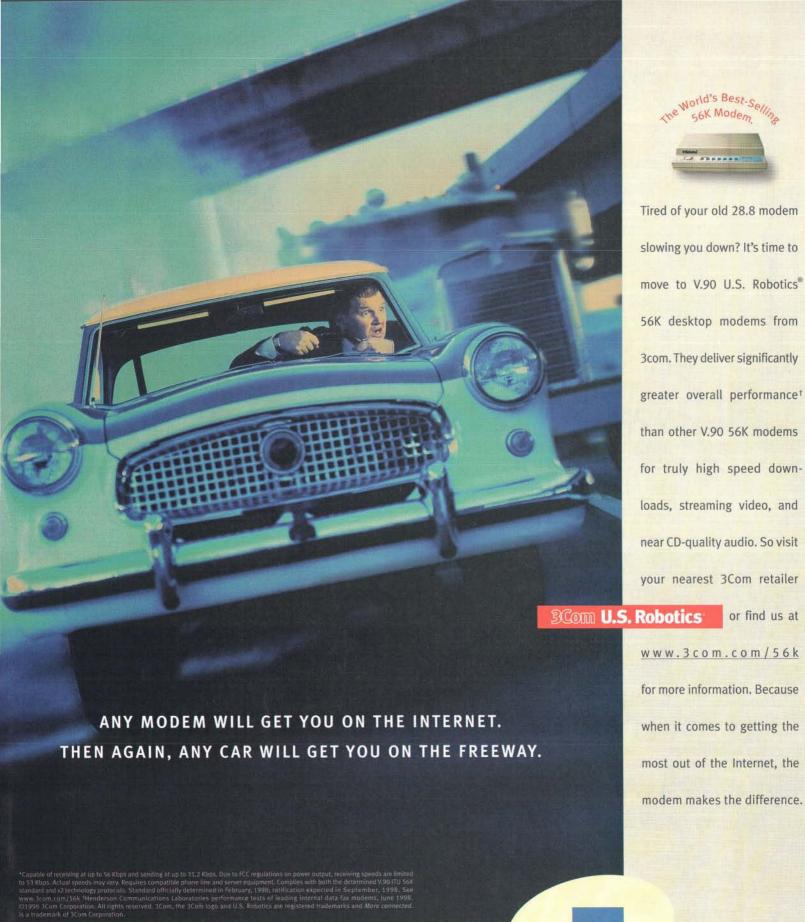
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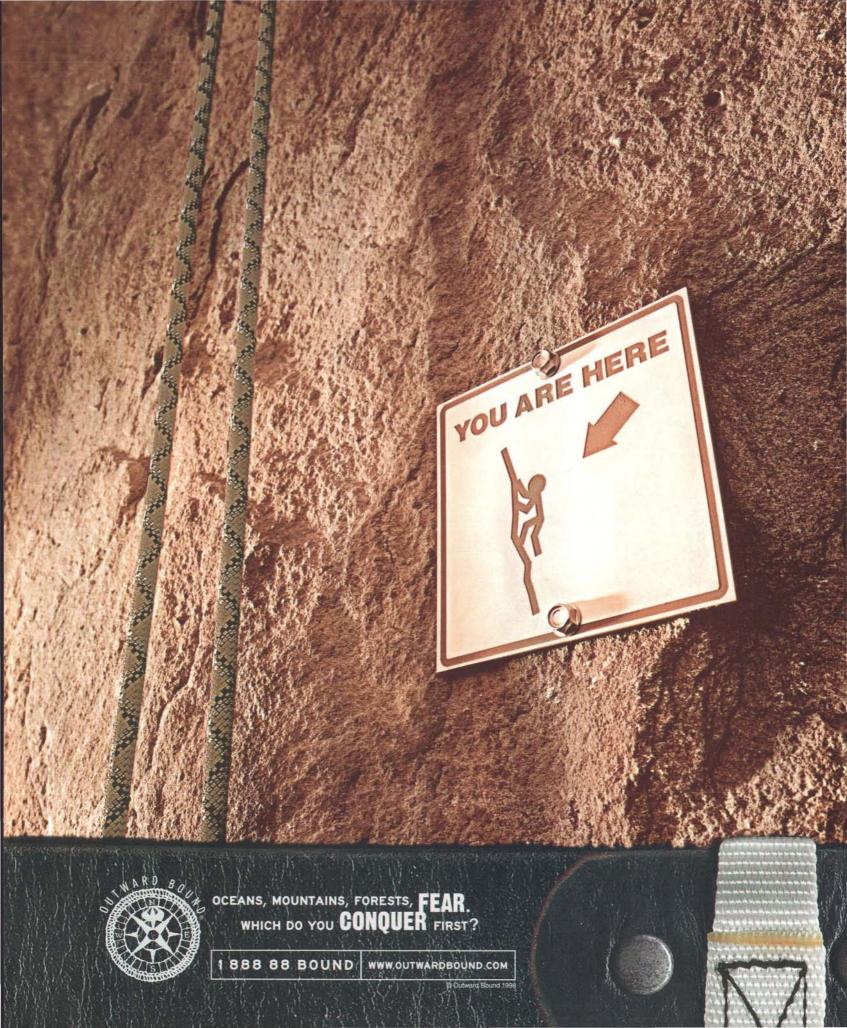




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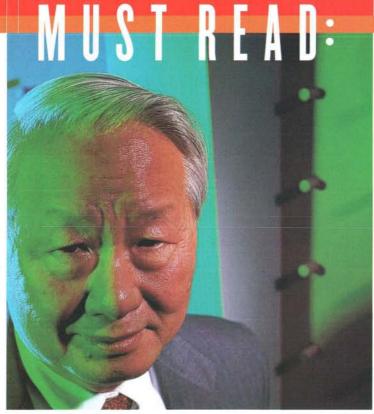
## CHIPMAKING

# Paranoid, Are Ya?

🤁 quarely at the heart of the global high tech economy, the chip business suffered through one of its worst downturns ever in '98, battered by the Asian financial crisis, stagnant PC sales, and a surfeit of cheap memory chips. Everyone hurt, even giants like Intel and Motorola.

But in any downturn, some come out ahead, and the Taiwan Semiconductor Manufacturing Company might just teach Silicon Valley how to succeed when exponential growth isn't a given. Legendary for turning a profit even with its fabs at 50 percent

Formed in 1987 as a joint venture between Taiwan's gov-TSMC was the pioneer "pureplay foundry" - the first chipmaker to focus solely on making chips to the specs of outside clients. At the time, skeptics scoffed, but last year TSMC's single-mindedness resulted in profits of \$620 million (on revenue of just \$1.5 billion). If the old joke in the chip biz was that



Taiwan's Andy Grove: TSMC founder and chair Morris Chang.

capacity, TSMC is a case study in "real men have foundries," today's logistical, technological dexterity. talisman is the "fabless semiconductor" design house.

TSMC's approach is one item in ernment and Philips Electronics, its arsenal. Another: founder and chair Morris Chang - Taiwan's Andy Grove. Every bit the urbane, pipe-smoking mastermind, Chang pins TSMC's success in part on its awareness that chipmaking "is no longer a manufacturing business - it's a service business."

> Recently, Chang completed a billion-dollar plant in the States and announced plans for another

in Singapore. While Western companies once rushed to Asia seeking cheap labor, Chang recognized that labor is no longer so key in chipmaking. Capital costs overshadow the diminishing difference between what top-notch engineers get paid in Taiwan, as opposed to Santa Clara. On the other hand, a few hours' of delivery time saved can determine who profits and who doesn't.

Morris Chang is serene: "We have the edge on everyone." - Andrew Leonard

## INCENTIVE PAY

# **Know Your Options**

s stock options become the financial incentive for today's free-agent workforce, it's not just the three-letter execs who are being fitted for the "velvet handcuffs of the compensation game." So naturally the question arises: Who's getting the fairest share(s)?

To find out, Wired tapped iQuantic, a San Francisco-based concern that tracks equity practices. This chart is a composite of options disbursements at publicly traded computerperipheral companies in Silicon Valley.

- Brad Wieners

#### POSITION MEDIAN ANNUAL GRANT (shares) \* CEO 97,000 CFO 24,000 **Top Sales** 19,000 Chief Technical Officer 16,000 **Top Business Unit** 14,000 **Top Marketing** 14,000 **Top Human Resources** 11,000 **Chief Information Officer** 9,000 Controller 7,000 1,000 Manager, Network Systems 1,000 Manager, Applications Programming 600 Senior Technical Writer 500 **Product Marketing Specialist** Sales Support Representative 500 **Customer Service Representative**

\* Based on a company with \$1 billion in revenue, a stock price of \$25, and 100 million shares outstanding

## ECOMMERCE

# **Live Nude Trades!**

t looked for a while like money might outstrip sex as the intoxicant of the decade, but Seth

Warshavsky, a Seattleite whose Internet Entertainment Group is one of the chief purveyors of online fleshpots, has made room for both the primal urges at once.

Warshavsky's SexQuotes (www.sexquotes.com/) allows customers free simultaneous peeps at semiclothed women and semicurrent stock prices (the site advises that index quotes are delayed "at least 15 minutes") - a "megamerger" of nookie and Nasdag. Not surprisingly, finance isn't the stocks-and-blonds site's hottest product. "We use it to drive traffic to our other sites," explains the 25year-old CEO. Ads on every screen beckon users to IEG's hundreds of ecommerce ventures, like the Golden Oasis casino (www.golden oasis.com/) and Club Love (www .clublove.com/).

IEG's cross-promotion strategy has so far been fruitful. (See "Sex Sells," Wired 5.12, page 218.) The company expects revenues of \$50 million for '98, more than double last year's take. But IEG, which Warshavsky hopes to take public in '99, is also hedging its bets, diversifying into such unsexy ventures as home mortgages (www .zerodown.com/) and golf clubs (www.golfliquidators.com/), tamer sites for the two-handed typist.

- Paul Boutin



# Bill Drennon



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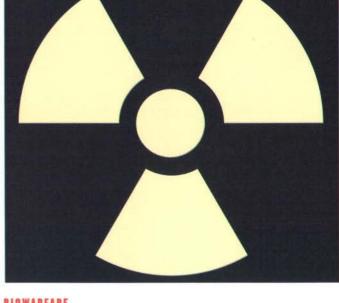
# **Caching Diana**

nce, Mohamed Al Fayed was just a very rich Egyptian immigrant who owned Britain's toniest department store, Harrods. All that changed in the



summer of 1997, when one of his sons began dating the toniest member of Britain's royal family, Diana. We all know how that ended up. From the moment Dodi and Di expired, though, the elder Al Fayed has looked beyond the wreckage of their drunk-driven Mercedes for deeper causes to the tragedy (earlier this year, he was quoted as saying he is "99.5 percent certain" a conspiracy was behind the deaths perhaps, the press speculated, as a way of shutting down Di's anti-landmine campaign). Now the billionaire has brought his truth quest to the Web, launching www.alfayed.com/. The site ostensibly offers "a comprehensive database of newspaper articles relevant to Mr. Mohamed Al Fayed's interesting life," but in fact most of the scrapbook concerns the Couple - the Romance, the Crash, the Funerals, the Aftermath.

The tycoon indulges in a little self-promotion, too. Among the site's frontdoor images of Al Fayed's very important properties (the Paris Ritz, for one) is a picture of a British passport - he's been fighting the Home Office, so far unsuccessfully, to get citizenship. - Judy Bryan



#### BIOWARFARE

# **Mini Weapon of Mass Destruction**

t won't set off a worldwide epidemic, and it isn't much good for biological warfare, but the bacterium Thiobacillus ferrooxidans could do more harm to humans than any microorganism in history. In fact, this unassuming life-form could spur a different kind of war - the nuclear kind - by helping weapons builders get at previously worthless uranium deposits.

India, like most countries, has meager rich-ore uranium reserves. Even before the recent resumption of its nuclear arms race with neighboring Pakistan and China, India was running low on the uranium it needed to build new bombs: By some estimates, reserves would run dry in less than a decade.

That's where T. ferrooxidans comes in. Commonly found in acidic mine water and waste ore, the bacteria has already proven itself a miracle miner of copper and gold; it works by oxidizing metal sulfides. Put simply, T. ferrooxidans devours useless rock, leaving behind valuable ore. Although it works slowly, the organism may prove the only way for mining companies that have depleted their high-grade material to collect the low-grade stuff.

Scientists at India's Agharkar Research Institute realized that with T. ferrooxidans, India could extract enough uranium to shore up its stash of warheads. And when fresh lodes went lacking, the government could return to old sites - the US Department of Energy found that the bacteria could actually extract uranium from the soil surrounding polluted uranium mines.

Not surprisingly, India isn't the only country looking into T. ferrooxidans and uranium. According to Simon Silver, a microbiologist at the University of Illinois at Chicago, there may also be efforts under way in Spain, Brazil, and Pakistan.

If the Agharkar scientists succeed in exploiting their nation's meager uranium reserves, T. ferrooxidans will be a bit like the shapeshifter that roams the road of death in ancient Hindu myth: neither good nor evil, but definitely dangerous. Despite the hype about the coming age of biological warfare, we may find that conventional nuclear war, assisted by biology, is in fact our greatest threat.

- Geoff Shandler



Corporate jets

**PalmPilot** 

Calcium supplements

CDs

Pet ferrets

Home office

**Titanium** 

Tomb Raider

**American Express** 

Champagne



Gyroplanes

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## March 1999 Patently Easy

The US Patent and Trademark Office completes its online database. Now you're just clicks away from the text and scientific sketches of 2 million patents registered from 1976 to 1999 including Bill Gates's only official patent (No. 5,552,982). Bonus: trademarked symbols, names, and sounds dating to the mid-1800s, such as the roar of the MGM lion.

## Dec. 2000 Lord of the Screens

J. R. R. Tolkien's The Fellowship of the Ring comes to a theater near you, courtesy New Line Cinema.



**Director Peter** Jackson (The Frighteners, Heavenly Creatures) translates Tolkien's imagination with Al software that

drives CG extras in the movie's colossal battle scenes. Technology that morphs full-size actors into Hobbit dimensions allows for star casting, but Jackson dispels the Net rumor that Sean Connery will lead.

#### 2001 High Way

Jet-setters take to the air in M400 Skycars. Punch trip coordinates into an onboard computer/GPS unit and Moller International's four-passenger vehicle flies you to your destination, reaching altitudes of 30,000 feet and speeds of 350 mph. Dual parachutes and multiple air bags should appease the aerophobic.



- Jennifer Hillner and Patricia Krueger

# **Smart Spider Goes Shopping**

# It already dominates the search engine game. Now Inktomi is charging into ecommerce. By Charles Platt

here does a San Mateo start-up go after selling its search engine technology to heavy hitters like Yahoo!, CNET, and the Microsoft Network? In the case of Inktomi, it goes shopping.

In September, Inktomi paid \$90 million (in stock) to buy another start-up, C2B Technologies, whose shopbot was still under development. (Months earlier, Inktomi pulled off a sensationally successful IPO, going out at 18 and closing at 36 with a market value of \$739 million - a figure that doubled in the next three months.) The strange marriage portended a new direction for an aggressive company outgrowing its market niche. Says CTO Paul Gauthier: "We see ecommerce as another core piece of the Net experience."

Gauthier was a grad student when he cofounded Inktomi in 1996 with Eric Brewer, his former Berkelev professor. The company name derives from the Lakota Indian legend of a small spider that outsmarts bigger rivals. Sure enough, Gauthier and Brewer convinced the major search engines to abandon mainframes and run Inktomi software on clusters of cheap, off-the-shelf computers. Yahoo! now uses Inktomi's setup on 100-plus machines networked to pool data from their hard drives.

But despite the company's success and the high markup on its software, there's a limited market for heavy-duty processing power.

So Gauthier and Brewer, noticing that certain sites were being requested by thousands of users every day and ISPs were constantly retrieving the same pages from distant servers, came up with a new idea: They proposed that each ISP maintain its own local copies on a cluster of workstations running Inktomi software. The idea evolved into a product they called Traffic Server, which launched in October 1997. AOL and UUNet were the first to test the concept. In September, Inktomi released Traffic Server 2.0, which could cache RealNetworks audio and video streams.

But, again, there's a limited market for these massive data caches, which cost around \$1 million apiece. To grow further, Inktomi needed a broader base. Hence its interest in C2B.

"C2B has an exclusive agreement with Consumers Digest, allowing back-issue searches," savs Kevin Brown, Inktomi's director of marketing. "They have a price comparison engine, to find the lowest price among all merchants linked in their database." C2B's shopbot will also let users post questions and view opinions from other consumers.

"Portal sites are doing a lot with consumer profiles," notes Paul Hagen, a Forrester Research analyst. "If Inktomi software running at Yahoo! can gather manufacturers' product data and match it with your profile, Yahoo! can offer you merchandise you're more likely to buy."

This gives Inktomi a new application for its search-and-compare functions - without leaving its niche of supplying backend software to Web companies.

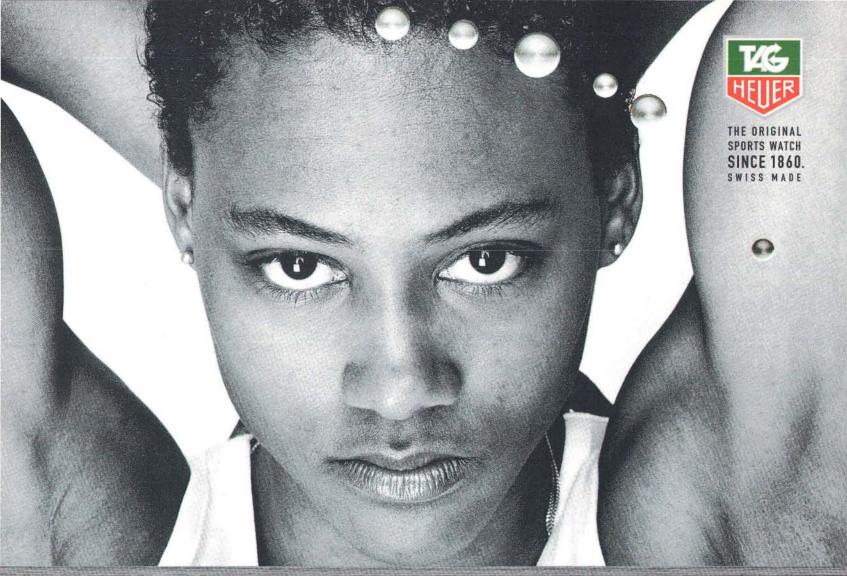
There are potential snags in online shopping. "The real struggle is to sign up retailers with strong offline brands, such as Gap or J. Crew," says Hagen. "Those companies are more concerned with brand loyalty and quality, not just price comparison."

But Inktomi isn't about brands. "We're still focusing on Internet infrastructure," Gauthier says. "We build the engine room, and our partners build the trim on top of it." Says Brown: "We look for any big scalable problems that need to be solved as the Net grows up." = = =

Charles Platt (cp@panix.com) is a contributing editor at Wired.



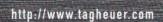
On a buying spree: Inktomi's Eric Brewer (left) and Paul Gauthier.



# INNER STOTISTICS TO THE TOTIST OF THE TOTIS

WINNING IS A REFUSAL TO ACCEPT SECOND PLACE. IT HAS HAPPENED TO ME A COUPLE OF TIMES AND TO BE HONEST I HATED THAT FEELING.

MARION JONES
100m SPRINT WORLD CHAMPION.





#### **ECOMMERCE**

## **Shopbot Pandemonium**

As shopbots get smarter, their behavior may get dumber.

That is one striking discovery stemming from a series of simulations conducted by IBM that deployed "news brokers," a similar species of software agent.

Shopbots, of course, are the comparison shoppers of the Web, tiny programs that go in search of the products and services users request.



They've already become standard features at search sites like Yahoo!, Excite, and HotBot and at shopping networks like go2net's WebMarket. But once shopbots really proliferate and become better at finding what people want

at the best possible price, they could trigger mindless price wars that ultimately hurt both buyers and sellers. "There's potential for a lot of mayhem once bots are introduced on a wide scale," says Jeffrey Kephart, manager of an IBM group that studies intelligent agents and similar phenomena. His mandate: Find ways to avert the coming chaos.

Today's shopbots are, as a rule, fairly stupid. They exhibit little or no ability to learn (either about user preferences or changing market conditions), rarely communicate or negotiate with one another, and usually just spit back a list of products sorted by make, model, or price.

In their simulation of a futuristic economy, researchers at IBM's Institute for Advanced Commerce in Hawthorne, New York, set up inbaskets for 10,000 buyers of news articles. About 500 news-broker agents mediated between the bots working on behalf of consumers and those representing about a dozen vendors, or publishers. The bots were instructed to purchase articles from a publisher and sell them to consumers to maximize profits. The result: Periods of relative calm and brief prosperity for the publishers, punctuated by violent, sporadic price wars. In the cyclical bouts, two or more sellers offering the same product (a set of news categories) kept undercutting one another until some or all of them bailed out. IBM's conclusion: The price wars could hurt not only sellers, by forcing disastrous price slashing, but also buyers, because sellers soon retreat from the general market into narrow niches.

Kephart is most interested in what happens when the Web teems with billions of competing bots. If online sellers of everything from airline tickets and hotel rooms to insurance and mortgages want to remain in business, they will have to learn when to negotiate, when to hold firm, and when to negotiate a discount. To be successful in the future, he says, shopbots will have to become better at comparing qualitative aspects of various products, not just prices.

Software agents "make decisions and act on them at a vastly greater speed" than humans, Kephart and his team write. "But they are immeasurably less sophisticated, less flexible, less able to learn, and notoriously lacking in common sense." – Evan I. Schwartz

ECOMMERCE

#### **Shopbots: Three Degrees of Automation**

attie Maes knows her bots. And in speeches to audiences anxious about the fate of their online businesses, the MIT Media Lab professor and Firefly Network cofounder provides a handy way of categorizing the various shopping agents she believes will one day run our lives. Here's a look:

Type of Shopbot	What It Does	Who Offers It	Who Builds It
Product brokering	Alerts users to new releases or recom- mends products based on past selections or con- straints specified by the buyer	Amazon.com, FastParts, Classifieds2000, Launch Media, and others	Firefly Network, Net Perceptions, PersonaLogic, BroadVision, and others
Merchant brokering	Acts as comparison shopper by collect- ing information about price and availability	Yahoo!, Excite, BargainFinder, WebMarket, priceline.com, and others	Jango, Junglee, C2B/Inktomi, Fric- tionless Commerce, OptiMark, and others
Negotiating	Buys, sells, and bargains with other bots about multiple aspects of a trans- action based on user parameters	No one yet, although auction sites function as such	In research phase: Kasbah, Tete-a-Tete (MIT Media Lab), AuctionBot (Univer- sity of Michigan), and others

Beyond these, there are other new technologies that can function like a shopbot. Alexa Internet (www.alexa.com/), founded by Thinking Machines cofounder and WAIS inventor Brewster Kahle, offers a toolbar that floats beneath Web browsers. When activated, the bar provides users with additional information about the sites they're visiting. Info on where a site originates and what other users think of it, as well as links to other sites, qualifies the bar, in Maes's eyes, as a "recommendation engine" or "merchant broker."

BusinessBots, the brainchild of computer game industry whiz Moses Ma, act every bit the part of shopbots, only in the enterprise space – i.e., business-to-business. Ma is mum about rollout plans, but hints that BusinessBots will further automate things like bidding for outsourcing contracts. – *Brad Wieners* 

#### BIOTOOLS

#### **Tiny Tongs**

ost of us remember poking around a frog's innards during high school biology with a pair of rusty tweezers. But imagine tweezers that let you grab not just a liver, but individual cells, or even snippets of chromosomes, but such a device has been built.

chromosomes. Just such a device has been built by Katsuhiro Ajito, an NTT senior scientist in Atsugi, Japan. Ajito's nanotweezers can capture tiny pieces of organic material with the radiation pressure generated by a laser beam, while using the laser's scattered light to identify a sample's chemical composition. Just as today's surgeons poke and prod at a patient's major organs, tomorrow's may operate at the cellular level with nanotweezers, repairing us from our genes on up.

- Robert A. Metzger

efiction

www.borders.com is an IBM e-business.

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Ranking Tendency

Life Expectancy

Rich Media Advertising

Are Netfomercials ready for prime time? Companies such as InterVU see plenty of creative/commercial promise in pumped-up banner ads; ad agencies anticipate pop-up order forms and other in-your-face bits will lure deep-pocketed advertisers; broadbanders like @Home plan to leverage streaming audio and video to push their fat pipe into America's living rooms. Critics, on the other hand, call rich media advertising "the equivalent of spam." And Web design's headed the other direction, trimming download times to serve the lowest common denominator. Finally, there's little evidence blaring banners will do anything but annoy browsers. Click.

Web-Based Calendaring

18 months

You've got free hot stock quotes, hot talk, and Hotmail - how about a Web calendar to keep track of hot dates? EventCenter & Co. have staked out a niche serving shared schedules to companies and colleges, for a fee. But with When.com promising Webpointment books free of charge, the excited yahoos will undoubtedly rush to host their own cybercalendars. Even LAN-based planners, though, make people insecure about getting too personal, and the public Internet has its own set of privacy issues. Plus, if free calendars do drive portal traffic, one-to-one marketing will be along for the ride. Expect to see Swooshes dancing alongside your basketball schedule, or Mumm's and Trojans come Valentine's Day.



Tech journalists will flock to any technology that delivers an order of magnitude increase in speed - call it Moremoremore's Law. Take BLAST (Bell Labs Layered Space-Time), a fixed wireless networking technique that got gushing coverage for exploiting the "multipath" scattering of a message in the air to produce a tenfold increase in performance. BLAST's breakthrough, however, requires multiple antennas with clear line of sight, making it most effective in rural areas, corporate campuses, and other pastoral settings. So no go if you're an urbanite trying to conduct a strategy session from inside a cab - but great for a conference on crop rotation.

#### **Check Cashing Machines**

12 months

Plastic surgery may soon replace forgery, thanks to Mr. Payroll, a biometric check cashing machine popping up in Circle Ks, grocery stores, and lowincome areas in the Southwest and Southeast. Unlike regular ATMs, CCMs rely on facial recognition to authorize a transaction, so would-be check cashers must have their mug scanned before they can get at the scrilla. This, Mr. Payroll's president declares, is revolutionary convenience for people in "underbanked" communities. And he knows the neighborhood - Mr. Payroll is a subsidiary of Cash America International, the pawn-shop holding company. Imagine: Soon downsized bank tellers will be able to cash their last paychecks and buy guns at the same time. Next!

- Jesse Freund (hype-list@wired.com)

### Biotech's Plan B: Merge

#### After a stormy season on Wall Street, the gene mappers and cancer curers are turning to the big pharmcos for help. By Joan O'C. Hamilton

or well over two decades. biotech firms have wooed analysts and investors with The Story - that compelling promise to cure cancer or other horrible ills and make billions in the process. But in corner offices throughout the industry, promise is turning into despair. After sitting out the boom of the last three years, biotech stocks hit a three-year nadir in September. and most have scarcely recovered since. With market caps shrinking, veteran players are under pressure to hold down costs and goose product development. But for hundreds of smaller and younger companies with names that once captured Wall Street's imagination, like Cytel, Magainin Pharmaceuticals, or Shaman, the situation is dire. Payoffs from new drugs are still years away, and in the meantime a sustained bear market could force the companies to sell off their research and technologies to bigger partners - or kill them off completely.

Biotech firms have always faced extraordinary odds - they often go a decade before getting their first product approved - but now over 100 have less than two years worth of funding in hand. And at least that many pre-IPO start-ups may never even get in the game if the equity markets shut off.

Conventional wisdom says the smaller players have two basic options: Find a way to generate near-term revenues through research alliances, or merge complementary companies to pool cash and push the best products forward.

The industry has plenty of experience with the former

option. Three years ago, when the picture looked nearly as bleak, the traditional pharmaceutical industry came to the rescue. The big pharmcos, who had grown fat raising the prices of me-too drugs every year, realized their pipelines were growing bare and became desperate for new technology. Roche, Pfizer, Eli Lilly, SmithKline Beecham, and others started inking research collaborations with struggling biotechs by the hundreds.

For some older firms and even some newcomers, these deals proved the perfect inoculation against an indifferent stock market. In the burgeoning field of genomics, for example, players such as Incyte have been funneling their research into proprietary genetic databases that the larger drug and chemical companies are paying big bucks to access.

For every Incyte, however, there are dozens of companies with much narrower technology, some pinning their hopes on a single product. These firms continue to do as many deals as possible with big pharmaceutical partners or larger biotechs, but they may end up with such a tiny piece of the eventual profits from any drugs they do develop that it's almost not worth the trouble.

And the intense competition created by so many little birds needing worms is causing problems. "We finally said 'enough,'" says William Haseltine of Human Genome Sciences. "We're not going to even look at anybody for a while." Haseltine says his cashflush company is besieged with requests for meetings and that he already hears from at least 10



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"Merging always seems like a good idea until you really think about it," adds James Gower, CEO of biotech start-up Rigel. There's an enormous amount of great technology living inside these little companies, but merging often creates a need for even more capital to develop it. "There's never been a merger in our industry that's really 1 + 1 = 3," says Steven Gillis, chief executive of Seattle's Corixa. That's because companies wait too long to consolidate, and even those with cash have already committed it to long-term projects.

For all biotech's woes, says George Rathmann, founder of Amgen and now chief executive of Bothell, Washington-based ICOS, nearly everyone agrees that "the science is so much more powerful than it was 10 years ago." In fact, the first part of The Story hasn't changed: There are about

#### With grand alliances consolidating profits, biotech's little birds are locked in intense competition for worms.

250 important drugs in clinical trials today thanks largely to innovative biotechnologies. But in a tentative, or, worse, sour market, it's likely these upcoming blockbusters will make billions for the big, well-heeled companies who pick them up for a bargain, not the start-ups who got the ball rolling. For them, it seems the biggest challenge is learning how to clone money.

Joan O'C. Hamilton edits Signals (www.signalsmag.com/), an online magazine about biotechnology, and has covered the industry for 15 years.

### Gimme Shelter

hen disaster hit Russia in August, vaporizing the world's top emerging market within days, Sergey Skaterschikov's Skate financial-news and Webservices firm was hurt - he cut his staff by 30 percent. His long-term remedy: Go global with e-trading.

Through a partnership with Palo Alto, California-based E\*Trade, Skaterschikov will launch E\*Trade Cyprus, an online securities-trading service, in the middle of next



Ruble rouser Sergey Skaterschikov.

year. The target market: Russia's Net-savvy nouveau riche, who live much of the year in offshore tax havens. "This will give investors access to US securities through Cyprus accounts," he explains, and those clients, he adds, will be wealthier than their US peers. "E\*trade's typical customer is your middle-class American," Skaterschikov says. "We've got quite wealthy clients - mostly Russians and Turks." But are they willing to forgo a broker's advice? "Russians love to do everything themselves," he says, "because they don't trust anyone." Within two years, Skaterschikov adds, he hopes to hold about \$20 to \$25 million in client assets.

Cypriot investors, and Skaterschikov, will put their trust - for now, anyway - in America's markets. "All the money's gonna sleep overnight in the US," he says. "To a Russian, the US market looks like an El Dorado. We may be deluding ourselves, but it still looks like it's paved with gold."

Russia's once-hot stocks and T-bills have fallen off the radar, but Skaterschikov likely won't. Just 26, he publishes the Skate Capital Markets Report and runs Netskate, operator of the country's most popular Web site, www.anekdot .ru/, and he is guickly maturing into the Peter Lynch of Moscow. American CEOs and Russian ministers seek his advice on securities in Tatarstan and IPOs in Siberia.

If the Cyprus venture flies, Skaterschikov anticipates E\*Trade systems in the Baltics, Turkey, and, well, Russia by 2000. "Russia used to rank higher," he says, "but we've had to reschedule." - Andrew Meier

#### BANDWIDTH

#### Fiber to the Penthouse

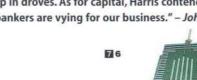
crget the last mile. It's the last hundred yards – the wire inside the average high-rise - where the real opportunity lives, according to David Crawford, president and CEO of Dallas start-up Allied Riser Communications.

Even after a telco or ISP runs fiber to the front door of most buildings, the lowgrade copper in the walls often keeps tenants from fully enjoying state-of-theart telecommunications. So ARC runs a fiber spine from basement to penthouse and links it to an on-site point of presence. Then, "it's just a matter of pulling a horizontal run over to your LAN," says ARC chief marketing officer James Harris, "and you have a 10-meg connection to the Internet."

It's a promising niche, and ARC comes armed with a clever business model, too. Instead of charging for the fiber, the firm wires buildings for free and then markets its networking services to tenant companies, splitting the proceeds

with the landlord. Since January it's been invited into 40 high-rises.

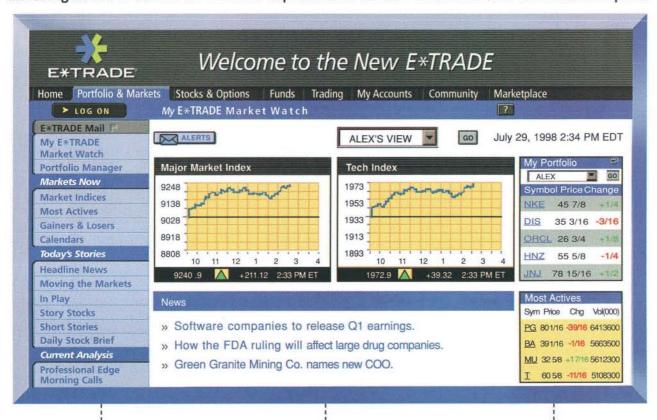
Build-it-and-they-will-come is a high-stakes game, of course. If ARC's services don't sell in a given building, the company eats the up-front costs. And if outside capital dries up, no new buildings will get wired. But so far so good, says Harris. Realtors get to boast about the bandwidth and tenants are signing up in droves. As for capital, Harris contends that "investment bankers are vying for our business." - John Rubino





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#### **Network Server**

"Voice over IP is a capability, not a service that people want," says Carly Fiorina, who just topped Oprah on Fortune's list of the most powerful women in business. Even so, the group president of Lucent Technologies' Global Service Provider business division isn't the type to toot her own horn. "Beating Oprah's just a reflection of the health of this industry," she demurs.

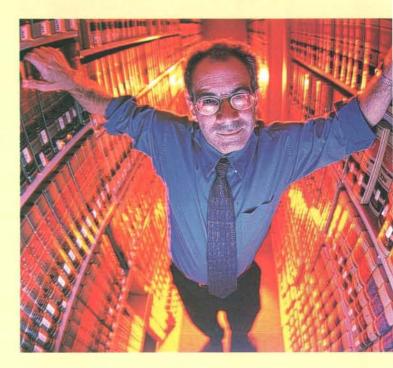
Still, Fiorina controls a \$19 billion division that accounts for 70 percent of the network giant's revenue. And that only stands to increase with the integration of data and voice, wireless and wireline, and packet and circuit networks. "The next five years," she surmises, "will make the last 20 seem like a lazy river on a hot summer day."

— Jesse Freund

#### The System on Trial

"Right now I'm spread a little thin," says Joseph Grundfest, understating his condition slightly. After serving as a commissioner at the Securities and Exchange Commission for four years, Grundfest became a professor of law and business at Stanford and has recently launched Financial Engines, a software company that puts market-analysis tools in the hands of investors. He's also busy redesigning Stanford's

Securities Litigation Clearing-house, the world's first attempt to post on the Web all documents relating to class-action investors' suits. Perhaps most significant, Grundfest is set to release a beta version of Project Local Motion, a threaded discussion platform judges can use to replace oral arguments in the courtroom. "In 15 years," he forecasts, "you'll have electronic argument, posting, and filing." – Jesse Freund

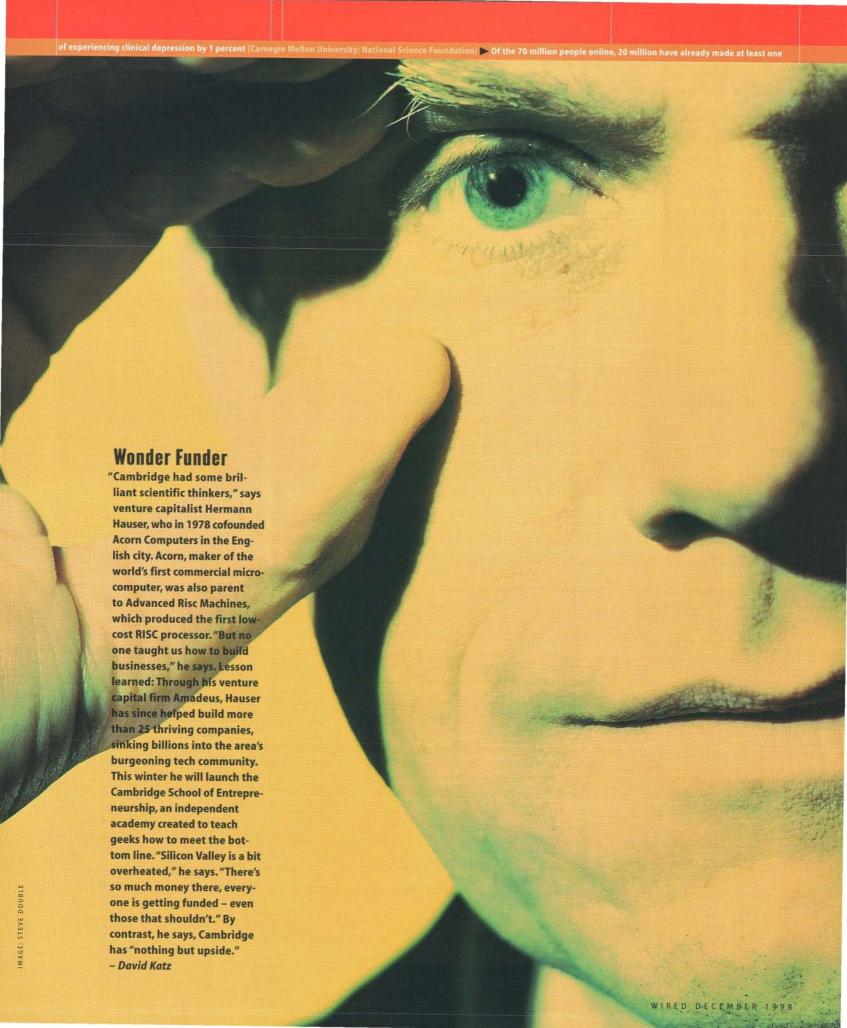






Hans Moravec is the John the Baptist of the coming robot kingdom. He spends his days at Carnegie Mellon's Mobile Robot Laboratory, teaching machines how to generate navigable 3-D snapshots of the world using wide-angle stereoscopic images. By night, he writes about the impending robot transcendence. In his new book Robot (see review page 226), Moravec predicts mechanical minds are about to replay the

evolution of biological minds. Soon mech warriors will take over the entire economy, launch themselves into space, and leave humans to live a happy, if dull, existence on the nature preserve known as Earth. "I'd like to have a machine I can have a high-level conversation with," Moravec says. "As a storage medium DNA has run its course. The iMac doesn't have floppy disks; our descendants won't have DNA." – Erik Davis



Fake user interface. GIF advertisements that have phony interface elements (search boxes, pulldown menus, input fields, et cetera) to trick you into clicking on them. Not to be confused with TFUI (touch-and-feel user interface), a gimmick used by a porn CD-ROM publisher.

#### Hook and Book

Cable TV slang for the hurried installer's practice of connecting a customer's cable and then leaving before testing it.

#### **MUD Flaps**

The excess body fat acquired through overeating and lack of physical activity due to playing online multiuser dungeons (MUDs) for extended periods of time.

#### Proof of Failure

A project that's intentionally sabotaged in order to make way for the approval for a different project."The data-warehouse project was a POF with SQL so the data group could implement Oracle instead."

The much coveted office cubicle with a window.

#### Weasel Text

A message posted on a Web page explaining why a popular site feature has been removed.

Tip o' the polypropylene balaclava to Kimbrough Bassett, Erin McKean, Mike Mackessy, Robert Rossney, and J. Richard Wilson.

- Gareth Branwyn (jargon@wired.com)

# **Dollar Signs**

ns the third millennium comes within spitting distance, two impulses dominate life around the globe - surging faith in capitalism and an endless fascination with the planetwide flow of data. To find their boldest expression, look to New York's Times Square.

In the past six months, the Square's gargantuan electronic billboards have been transformed into battlegrounds in the information wars, as different sectors of the once low-profile banking and financial-services industry compete to build the biggest and best signs.

These current spectacles, however, will pale in comparison to Nasdaq's display. Slated to go online in late 1999 at a reported cost of \$15 million, the sign adorning the Condé Nast building (future home of this magazine's owner) will be 11,800 square feet - the largest in Times Square. In a remarkable feat of engineering, a 100-foothigh Jumbotron-style video screen will wrap around the building, providing live television feeds and financial news from markets worldwide.

The company expected to direct this outdoor financial theater is Artkraft Strauss Sign Corporation. Led by Tama Starr, Artkraft builds most of these banners, and its profitable 100-year run is due in large measure to its success in monitoring the Square's ever changing pulse. "The displays in Times Square have always reflected the public's current obsessions," says Starr, "and the central message you get right now is similar to the message of the '50s: It's a straightforward expression of exuberance and optimism." Earlier in the century, she adds, "the public was concerned with consumer goods - Camel cigarettes, Hoover vacuum cleaners, Budweiser beer. Now the main preoccupation is with information."

The third-generation head of the family-owned



Tama Starr of Artkraft: Times Square's billboard baroness.

Artkraft, Starr is also coauthor of Signs and Wonders, a study of Times Square and signs.

Today's data-drenched displays are as much totemic as practical, she says. Of the Morgan Stanley Dean Witter banner, Starr notes, "It's more information than anyone can possibly process. But the overall effect is emotional. The display gives you a feeling of being a part of something much larger than yourself. It makes you feel good because it makes you feel smart." - Hal Stucker

#### BIOSCIENCE

#### Sperm with a Shelf Life

perm is a cocktail traditionally kept on ice. But storing it for use in animal husbandry or human in vitro fertilization requires a constant supply of liquid nitrogen to keep it fresh. The method is expensive and, in many places, impractical.



Ryuzo Yanagimachi at the University of Hawaii, however, is storing sperm at room temperature, and he has successfully fertilized mouse eggs with injections of freeze-dried mouse sperm. On a recent trip to Japan, Yanagimachi carried several ampoules of freezedried sperm in his pocket, and later still managed a 16 percent incubation rate - a remarkable feat for sperm that had been through the biological equivalent of going to hell and back.

This new technique is far from

perfect, but it's good enough for biotechnology company ProBio America to pay \$1 million for licensing rights. "You could literally store sperm in a Ziploc bag in your freezer, let it come back up to room temperature, and use it," says Laith Reynolds, CEO of ProBio.

Not only can cattle be impregnated wherever they happen to roam, but prospective fathers could stash a backup supply just in case their fecund flagellates suddenly stop swimming.

- Alex Salkever

# To Put This Problem Into Perspective, Imagine Someone Breaking Your Arm Because You Missed A Putt.

This December, the Lexus Challenge Hosted by Raymond Floyd will provide more than dramatic competition. It will raise funds to benefit Childhelp USA and The Entertainment Industry Foundation for the prevention and treatment of child abuse and neglect. Please join us in watching this prestigious tournament on NBC December 19th and 20th. For the love of the game, and for the sake of the children.







#### SET-TOP BOXES

#### **Inside Out**

hough they're found in 65 percent of US homes, cable set-top boxes remain a dense, dark mystery for most of us. Perhaps that's because cable boxes are kindly loaned to us by our friendly cable provider. But that's changing fast. Cable companies

have upgraded their pipe and now offer digital service to 50 percent of subscribers. By 2000, more than 2 million households are expected to sign up for digital cable. As set-tops go digital and dozens of new features are added. manufacturers plan to eventually

sell their hardware at retail outlets. Here's a look under the hood. in detail, of the Explorer 2000, rolled out in October by Scientific-Atlanta (www.sciatl.com/) - so far, it's the only two-way real-time digital set-top on the market.

- Jesse Freund

#### **Smartcard slot**

Order pizza over the tube; use a smartcard (or credit card) to pay for goods, then download more funds onto your smartcard via an input slot on the front of the box.

#### Downstream data tuner. upstream data transmitter

Offer Web browsing and email - some of the same services you get with a PC, but with a connection nearly 200 times faster: HTML and JavaScript compatible.

#### Analog componentry

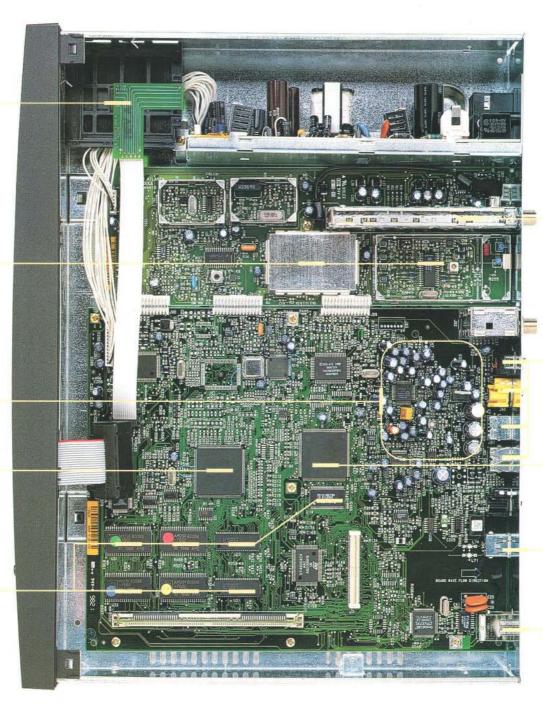
The equivalent of your existing analog set-top box.

#### Network processor

Custom designed by Scientific-Atlanta around a 54-mips Sun MicroSparc RISC processor; handles DES decryption, protocol stacking, memory management, and IP data filtering.

#### Memory

2 Mbytes of ROM, 2 Mbytes of flash memory, and 10 Mbytes of DRAM.



#### Analog and digital TV broadcast tuner

Digital cable offers a customizable, programmable viewing guide;more pay-per-view options and premium channels; and even a search tool to help you find upcoming Waco documentaries or shows starring Tom Selleck.

#### Home-video connectors

S video, SPDIF, basebands, and RF connectors to your TV, VCR, and other home electronics.

#### Media processor

Codesigned by Scientific-Atlanta, PowerTV, and SGS-Thomson; it decodes MPEG video and audio, as well as Dolby Digital.

#### **USB** port

Plug in peripherals, everything from printers to digital cameras.

#### **Ethernet port**

Use your computer to make an IP phone call by piggybacking on the box's built-in cable modem.

# Tive the experience!



#### It's a totally different way to stimulate your senses.

The Live! experience is a totally different way to interact with your PC. Our multimedia upgrades take you places you've never been. It's seeing and hearing for the first time. It's being there without ever leaving your seat. It's the adventure of a lifetime. Turn your PC into an extraordinary entertainment center — at an incredibly affordable price.

CREATIVE

www.soundblaster.com/golive/



#### **RULES? WHAT RULES.**



#### INTRODUCING THE IBM THINKPAD® 390 SERIES

Who said notebook computers were just for the big budget guys? The ThinkPad 390 gives small business professionals a fully integrated desktop alternative at a small business price. It's got a huge active matrix screen. It's got a built-in CD-ROM and floppy. It's got high-performance stereo speakers. And it's got a keyboard so roomy and solid-feeling, you'll forget it's a notebook computer. All the power you need. All at a price you can handle. See the full line of ThinkPad notebook computers at www.ibm.com/thinkpad or call us at 1 800 426 7255, ext. 5020.

@e-business tools

Intel® processors (up to 266 MHz) / Up to 4.3GB hard drive / 12.1" or 14.1" screen / CD-ROM / From \$1,799

### 





#### **Low Scorers**

In the land of online gaming, where ecommerce was supposed to emerge like a god, dazzling investors and gamers alike, the pay-per-play masses are, well, not

very massive. What happened? "It went to hell," says Jonathan Baron, a designer at game outfit Kesmai Corporation. "Everyone's hit a ceiling in [paying] gamers."

No wonder, says gamer Charlie Newman: "Who in their right mind would play online games for \$2.95 an hour, plus access fees, if they can play for free?"

In 1998, paying customers generated just over \$102 million – peanuts, considering the number of gaming services. Even so, TEN, Mpath, Microsoft's Internet Gaming Zone, and other companies are still bleeding away, with too much money invested to amputate just yet. Instead, Mpath et al. are shifting from a subscription model to an advertising strategy, still offering premium pay-to-play services but relying more on free game and chat areas to attract the hordes.

"It wasn't until we really got it – that it was about building a community around the games – that Mplayer.com took off," says Mpath Interactive CEO Paul Matteucci.

Where services are free, the number of players signing up is "doubling and tripling," according to Forrester Research, which expects pay-to-play revenues to reach \$333 million by 2002. And once the industry clears the PC-TV convergence hurdle, enough ads might get shoved down the pipes to make the bleeding edge less bloody. – Theta Pavis

Original story: "The Bleeding Edge," Wired 5.10, page 90.



### **Game Showdown**

A s giant computer-game publishers continue to gobble up small development shops, Bungie software is hanging onto its cherished independence. This season Bungie releases Myth II: Soulblighter, its sequel to the title that put the Chicago-based company on the map – and the key to the indie's survival.

With Myth II, Bungie is fighting the larger players the only way it can: technological innovation. "Changing technology is one of the few things that makes it possible for smaller companies to stay competitive," says CEO Alexander Seropian.

Myth II features a refined game engine built around the use of multimetric viewpoint: panning 360-degree camera work instead of a fixed isometric vantage. The game also sports improved AI, 3-D fire that creeps across the landscape, and, as the press release puts it: "ambient life like birds, squirrels, and chickens – that explode!" Entering a medieval story powered by Bungie's game engine is a bit like being a Steadicam

operator in a red-hot feudal epic.

But will fragged fowl be enough?

"Almost all of Bungie's peers have gone purely into development or sold out to a big house," says Vince Broady, editorial director at *Game-Spot*. But at Bungie, boasts Seropian, "there isn't a process that's more than a baseball bat's length away. There's nothing more frustrating than being dependent on a company you have limited interaction with."

Bungie's tactics for staying in the game also hang on bungie.net – a free service that offers multiplayer gaming over the Net. To ensure rabid fan involvement, the game ships with a level editor, dubbed Fear and Loathing, that allows Myth II makers to create new maps and scenarios. By treating players as collaborators, the 35-employee outfit gives fans a sense of ownership.

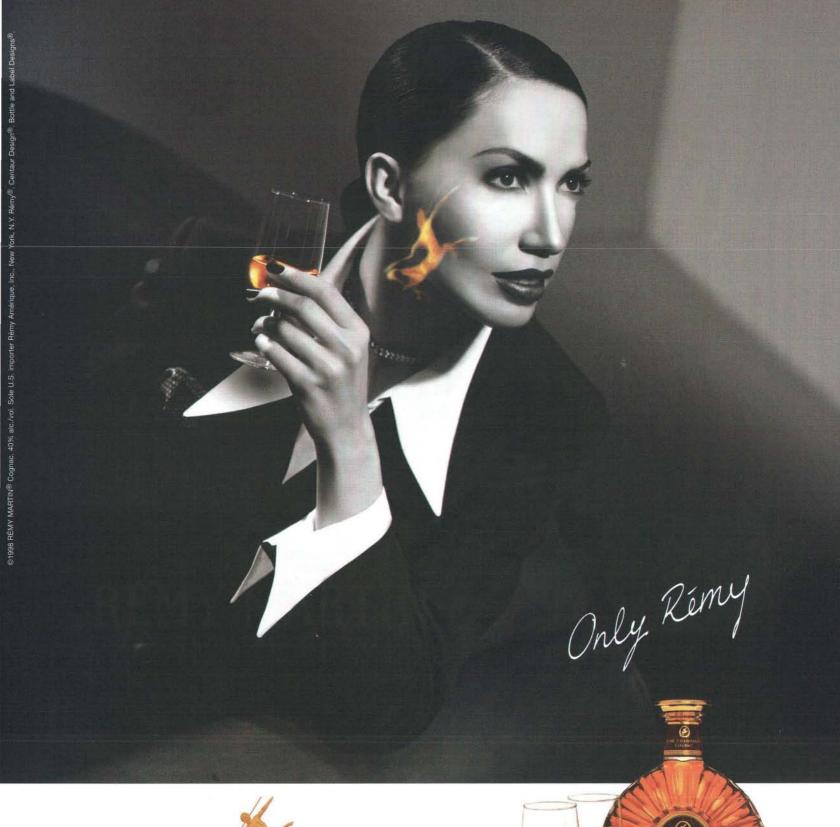
But the Internet is more than just goodwill hunting. "Last year, sales over the secure server were above \$250,000," says Publicity Engineer Doug Zartman. "We expect Myth II Bungie's jumpers (from left): Zartman, cofounder Jason Jones, Seropian.

preorders to push that to \$500,000 this year, and it'll be a million-dollar site by the end of '99."

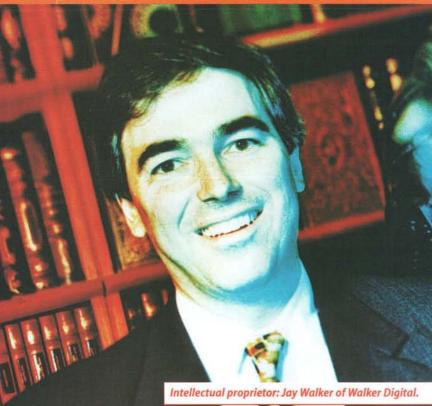
Over at the big would-be onlinegaming portals – TEN, heat.net, and Mplayer.com – you have to wonder whether the executives are getting any sleep. Having realized gamers won't pay to play games they already own, webcos have turned to ad revenue. But unlike Bungie, they have no content of their own to exploit.

Bungie is known for its content. Its 1994 shoot-'em-up Marathon, the Mac's answer to Doom, earned the company a cult following among Apple users. In 1997, Myth: The Fallen Lords became a cross-platform hit. And the company is spending twice as much marketing the sequel. A hit this winter will give Bungie a true foothold in the industry and prove that smart indies can survive.

Coming next after Myth II: an anime-inspired title featuring the heroine Konoko. And if Bungie's success holds out, she's sure to smash Lara Croft's little nose. – Tom Claburn







ECOMMERCE

# **Buy This Business Model**

he tough part about surviving Web fever is the business model. Which is why Jay Walker, founder of priceline.com and Walker Digital, isn't letting the good ones get by. Exploiting a recent court ruling affirming that business models can be patented, his company, Walker Digital, is licensing ways to sell on the Net. Among the commerce systems in his portfolio are 1-900 billing for online services and a structure for purchasing options to buy airline tickets. Wired asked Walker about his plans for squeezing more out of a decent idea than one crummy enterprise. - Clay Shirky

#### How did you get into the business of business models?

With priceline.com, there was no one around to license the model we'd come up with, so we finally decided to build the business ourselves. That was just to prove the model, though. In the digital age, what it is possible to do for the first time is to literally invent new forms of commerce.

### Will your revenues come from licensing or litigating?

Our job is to invent methods that other companies would be thrilled to adopt. Patents aren't a way for us to profit from piracy by claiming an idea, sitting on it, and then launching predatory lawsuits.

#### So what's the ratio of engineers to lawyers at Walker Digital?

I can't comment on that, but we have 25 full-time staff, and a lot of consultants. We have three groups: the invention group, which creates ideas; the commercialization group, which figures out where the revenue comes from; and the prosecution group, which secures the patents.

Is the value of patents increasing?

Most businesspeople don't understand the role patents will play in the future. Patents are a way to move value from one company to another, and they establish a backbone of intellectual capital that approaches the importance of financial capital and market capital within a company.

#### VIDEOGAMES

# 6

#### **Platform Pushers**

What has a 200-MHz processor, a Windows OS, a modem, a keyboard, and a CD-ROM drive?

Nope, it's not the latest Pentium II PC – it's Dreamcast, Sega's new game console.

Dreamcast, which went on sale for \$250 in Japan November 20 and will début stateside in fall 1999 with a \$100 million marketing campaign, is the first of a new breed. Along with the next PlayStation and Motorola's Blackbird, the box will vie for domination of the \$7 billion game market and test consumer interest in multipurpose entertainment platforms.

Dreamcast's ability to manage 3 million polygons per second makes it the most powerful console on the market, leaving even a high-end PC in the dust. In Japan, a partnership with WebTV lets Dreamcast players send email, browse the Web, and shop online. Game developers are signing on in droves, with 45 titles already in the works. "Dreamcast is a system that, on paper, can hardly fail," says John Davison, editor in chief of *Electronic Gaming Monthly*. "Pretty much every developer I've spoken to in the past couple of months is completely enamored with the thing." And that bodes well for a company now Number Three to rivals Sony and Nintendo.

Motorola is plunging into the market, too, with plans for a settop chipset that, thanks to ProjectX technology, will handle not only games, Web browsing, and ecommerce, but DVD movies as well. It's what James J. Farrell of Motorola's Media Processing and Platforms Division calls "all singing, all dancing."

So what are the chances for multipurpose entertainment platforms? History is littered with flops: 3DO, Pippin, the network computer. Farrell still isn't sweating it: "We've worked out a load of technology issues our predecessors didn't. We've learned from their mistakes." – David McCandless

#### COPYRIGHT

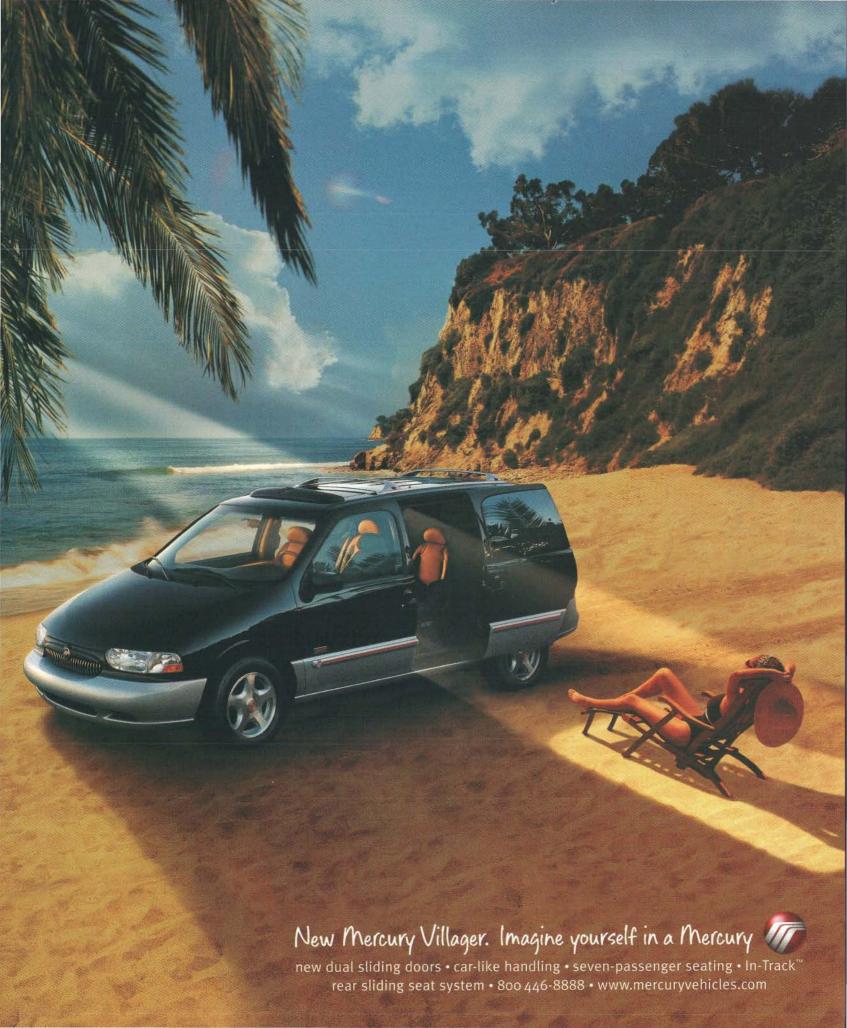
#### **Duke Nukem Crushes Micro Star**

"Duke Nukem routinely vanquishes Octabrain and the Protozoid Slimer. But



what about the dreaded Micro Star?" So begins Judge Alex Kozinski's recent decision in the case of Micro Star v. FormGen – a copyright-infringement ruling that barred Micro Star from selling videogame levels built by fans. For game enthusiasts, the federal court ruling means that the teenage code of honor discouraging the for-profit sale of usercreated add-ons has become the law of the land.

Todd Lappin





Imagine a camera with a chip inside that reacts to the movement of your eye, no matter where it wanders.





He likes baseball. She likes to surf. That used to be a problem.

But now there's a television that lets you surf during the commercials and pop back when they're done. Ain't technology grand?



The world's best gear TOOLS 101 products that inspire our technolust. And 25 incredibly cool surprises for kids.



# At Home At Work

Set up an office in your bedroom.

# You Oughta Be in Pictures

Make a movie in your attic.

# Studio Apartment

Burn a CD in your basement.

# The Small Mall

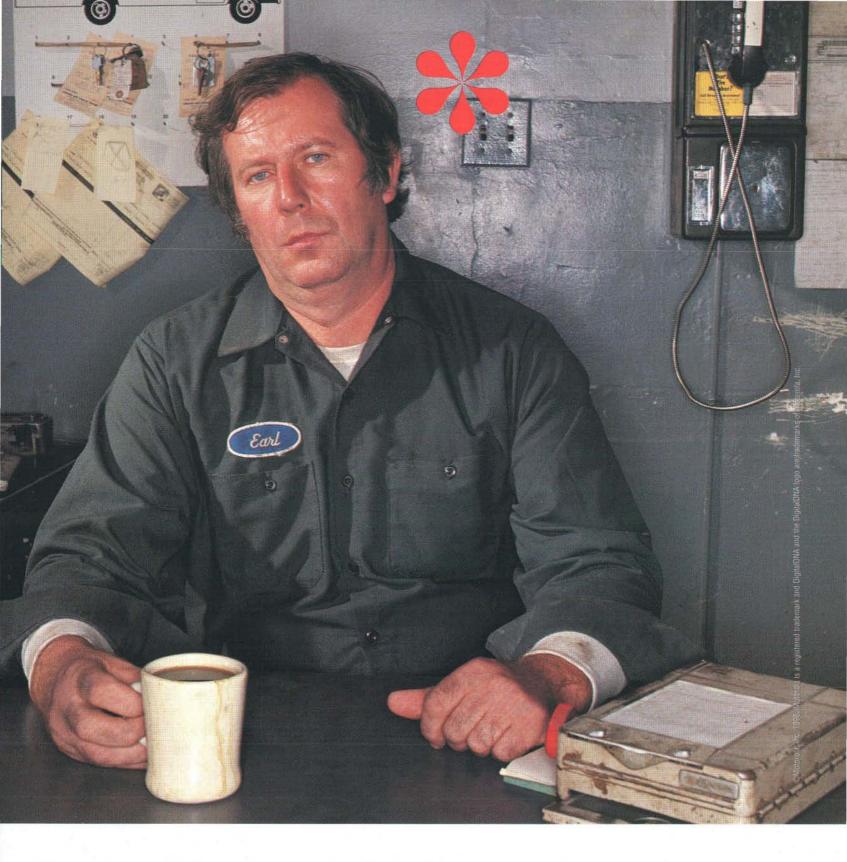
The tiniest stocking stuffers anywhere.

# Tools for Kids What to bring to show-and-tell.

# PCs for Peewees

Laptops – ages 9 months and up.

Editors: Jesse Freund, Bob Parks, Anne Speedie, Julie Sullivan. Design: David Albertson. Photography: Wendi Nordeck. Contributors: Jennifer Hillner, Patricia Reilly, Dave Katz, Nicole Levine. Copy Editor: Lesley Bonnet. Fact Checker: Jennifer Wieczorek. Photo Researcher: Stephanie Comer. Thanks to: www.nineup.com/.



Who'd of thought that an electronic chip inside your car could help you avoid curbs, other cars, and best of all, Earl in repair.





the 904 and 911 automobiles, the Model 583P is the luxury sports car of coffeemakers. It features Bauhausinspired looks and an insulated carafe to keep your joe at optimal temperature for hours. **Model 583P**: \$200. Porsche Design: +1 (310) 645 3020.

#### **Take Your Time**

Using the self-timer feature on a standard camera is like playing beat the clock. Relax. The detachable lens cover on the Endeavor 3500ix doubles as a remote control, allowing you to zoom in on yourself from across the room. **Endeavor** 3500ix Zoom MRC: \$479.95. Fujifilm: (800) 800 3854, www.fujifilm.com/.





#### Into the Groove

A device that plays five DVDs or CDs? Could be time for a retrospective of Madonna's singing *and* acting career. **DVP-C600D**: \$899. Sony:







Think cell phones have become, well, mundane? Try some extraterrestrial telephony. Iridium's handsome international wireless phone keeps you connected wherever you roam. **Kyocera Multi-Mode Telephone**: \$3,000. Iridium: (888) 474 3486, www.iridium.com/.



#### **Shock Absorber**

The GeneSys P133 handheld computer fits your xtreme lifestyle: It's designed to handle bumps and bangs, and sports a 10.4-inch touchscreen impervious to dust and water. **GeneSys P133**: from \$4,995. Xplore Technologies: +1 (512) 491 0554, www.xploretech.com/.





You know the beep-beep that helps you find the remote? What if the same technology could find your best friend? A digital collar. Now that's a new trick.







For car campers who are afraid to brave the outdoors unplugged but don't like to mess up the environment, there's the En-R-Pak. This 80-pound solar generator can power a color TV for 24 hours. En-R-Pak; \$1,469.99.
National Solar Technologies: +1 (716) 649 1324, www.en-r-pak.com/.

#### Incubator

Can't wait to teach your toddler the three Rs — in French? Better get the Tummy Tutor, a portable device that unspools music and language tapes for an unborn child. The small disc also plays back parents' recorded voices to stimulate in utero learning. **Tummy Tutor**: \$149.95. InuteroGarden: (800) 768 2008, www.tummytutor.com/.



The Millennium Countdown Watch comes preset to tick backward toward January 1, 2001. But you can reset it to count down to any occasion — even the Y2K D day, January 1, 2000. Millennium Countdown Watch: \$130. Skagen: +1 (702) 850 5500, www.skagen.com/.



KryoTech's Cool K6-2 computer runs at 450 MHz — a snappy 117 MHz faster than its AMD brethren. That's because KryoTech's cooling system drops the temperature around the processor to minus 40 degrees Celsius, permitting faster computing without meltdowns. **Cool K6-2**: \$1,695. KryoTech: +1 (803) 926 0066, www.kryotech.com/.

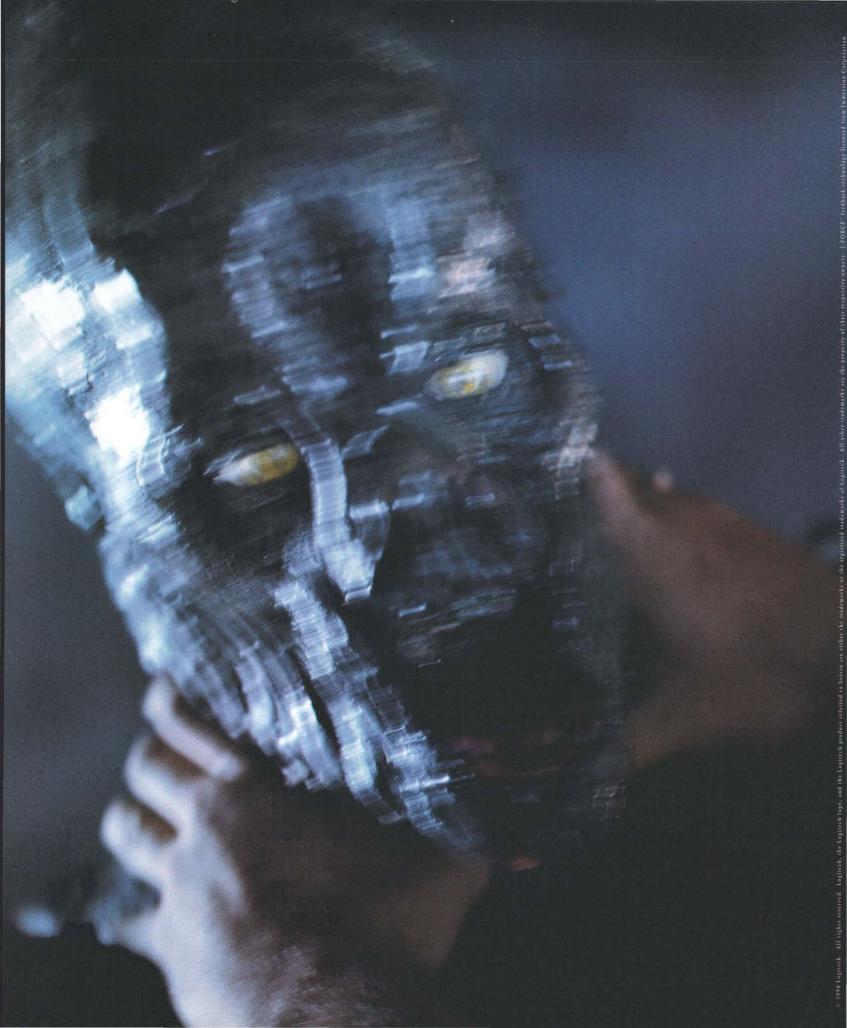






It's in your pocket: A smart card that digitally stores your insurance and medical information on a chip. Which would really come in handy, if say you pulled your back out, slipped, or dropped something on your toe.





Psychiatrists say it's important to feel something when you kill.









Cop Radio Remember when

Remember when your weird uncle spent all day huddled over the police scanner? Well, these devices have come a long way. Sony's entry connects to your computer and scans hundreds of channels simultaneously. ICF-SC1PC: \$429.95. Sony: +1 (941) 768 7669, www.sony.com/.

The Color Kinetics C-Series uses red, green, and blue LEDs to generate more than 16.7 million custom colors and lighting effects — perfect for a spaceage bachelor pad. **Color Kinetics C-75**: \$650. Color Kinetics: +1 (617) 423 9999, www.colorkinetics.com/.



**Long Distance** 

With most cordless phones, you're out of range long before you trot out to the back forty. But with this 2.4–GHz phone, you can make calls up to a mile from home base. **KX-TGM240**: \$349.95. Panasonic: (800) 211 7262, www.panasonic.com/.



Lexar digital film
records photos
faster than any
other film card —
up to 300% faster
(and yes we can
prove it in one of
those silly charts).



Yup, a zillion, trillion, billion high resolution photos. That's what you get with the highest capacity card on the market—a honkin' 64 MB film pack that lasts forever.

Thanks to our guys in white lab coats, Lexar film has been thoroughly tested and is guaranteed to work just dandy with any digital camera.

Now that you're into digital photography—take the film out of your digital camera, download your pictures to your PC and edit out those love handles from your beach vacation photos.

#### It's what makes digital cameras GO.

Just like the film you need for a 35mm camera, digital cameras require "digital film" to save and store pictures. But not all digital film is created equal. Lexar is the only digital

film that delivers a high octane boost to your digital camera. That means when it's "Loaded with Lexar," you have the speed and power to catch all the action.



Lexar Media has been tested in virtually every digital camera on the market including: • Agfa • Canon • Casio • Epson • Fuji • Hewlett Packard • Kodak • Konica • Minolta • Mitsubishi • Nikon • Olympus • Panasonic • Polaroid • Ricoh • Samsung • Sanyo • Toshiba • Vivitar • Yashica







# It can continuously sync with your PC so your information is absolutely current. Good news if you like your information while it's still relevant.

Set your Palm-size PC to automatically sync when connected to your PC, and you never have to worry about it again. It just happens. And one less thing to worry about is one less thing to worry about. These Palm-size PC manufacturers use Windows CE: Casio, Everex, Philips and Uniden.

If you know Windows, you know Windows CE.





















@ Calendar (Channels **©** Contacts @ Inbox

**Mote Taker** 

**Q**<sub>m</sub> Voice Recorder

(1) Tasks

















#### At Home At Work



Headset and Answering Machine

It helps to have your hands free when multitasking. Plantronic's TriStar is the lightest headset available, and it sounds great. And to make space so your fingers can do the working, hang the BeoTalk 1100 answering machine on your wall.

TriStar: \$108. Plantronics: (800) 544
4660, www.plantronics.com/. BeoTalk
1100: \$250. Bang & Olufsen: +1 (847)
299 9380, www.bang-olufsen.com/.

#### Telephone

Siemens's Cordless Communication
System combines the clarity of a desk
phone with the mobility of a 2.4–6Hz
cordless dialer. The main unit links to as
many as eight handsets — each with its
own extension. Cordless Communication System: \$399. Siemens: +1 (972)
997 7300, www.siemens-wireless.com/.

#### **Multifunction Device**

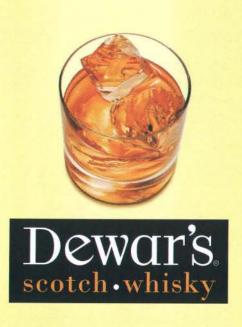
It's a laser printer that spits out six pages per minute. It works as a stand-alone fax machine. It's also a copier. It even scans documents. You could buy four separate machines, or you could get your hands on the HP LaserJet 3100. HP LaserJet 3100: \$699. Hewlett-Packard: +1 (208) 323 2551, www.hp.com/.

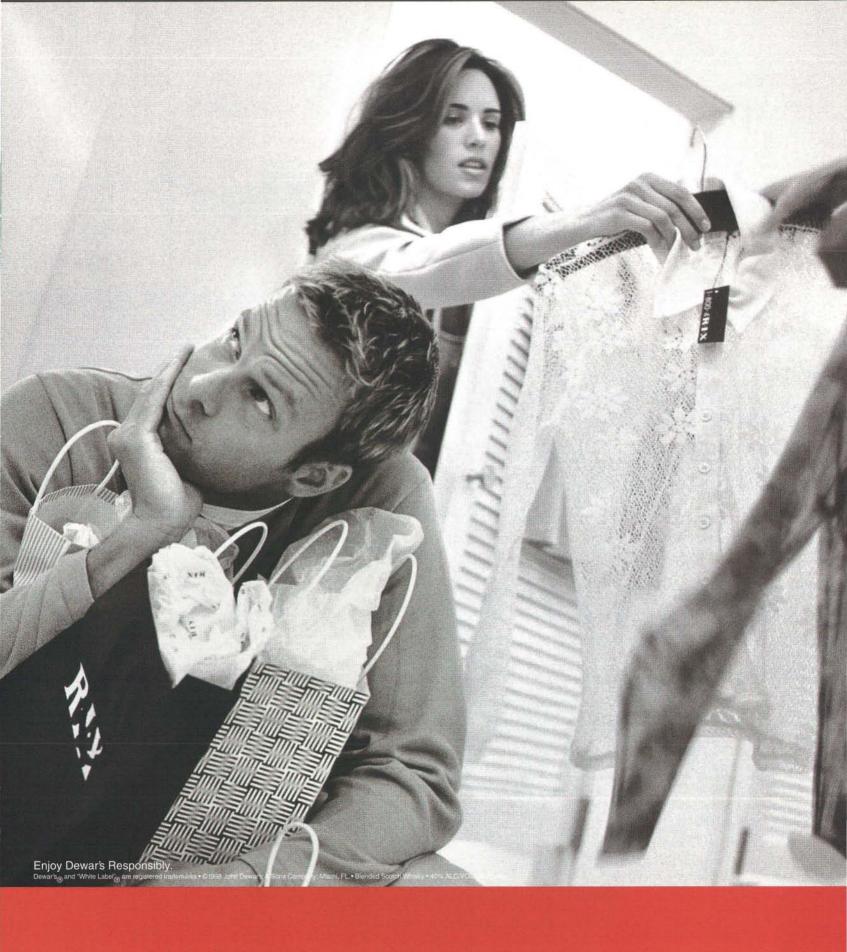
Setting up a home office can be a pretty ugly job. Your nonworkplace workspace falls under the category SO/HO, to use the parlance of the industry, but too often these spaces lack the style typically associated with SoHo design. The setup below showcases items built to help you work efficiently and to be easy on the eyes. Best of all, everything can be tucked away when you're ready to knock off for the day.





# A full day of shopping? Now that calls for a drink.









#### **Steer Clear**

Taking your hand off the wheel can be fatal at 183 miles per hour. So Ferrari's F355 F1 features the same shifter — a little clicker on the steering wheel — that lets Formula 1 racers change gears with their fingertips. F355 F1: \$144,265. Ferrari: +1 (201) 816 2600, www.ferrari.com/.



#### Big-Ass BBQ

Forget wimpy Williams Sonoma grills. Frontgate's Professional 53" Grill is buff enough to cook 72 burgers at once. It's got a built-in smoker and a 20-pound propane tank that would make even Hank Hill jealous. **Professional** 53" Grill: \$4,100. Frontgate: (800) 626 6488, www.frontgate.com/.

#### **Mow Better**

Cut the grass and catch some Zs: Once you plant the wire border to keep the clipper on your side of the fence, sensors help it avoid trees and lawn furniture. The yard bot even connects itself to a charger when it runs low on juice. **AutoMower**: \$1,800. Husqvarna Forest & Garden: (800) 438 7297, www2.husqvarna.com/.



## It goes about a country mile.

(City mileage may vary.)



#### The longest-distance cordless phone there is.

Panasonic introduces GigaRange, the world's first 2.4 gigahertz digital cordless phone. Never before has a cordless phone been able to go so far and sound so good. For more info call 800-211-PANA or visit www.panasonic.com/gigarange

B.4 III

Panasonic just slightly ahead of our time



# Dineh Mohajer-25 year old mail polish guru

I'm comfortable with my boyfriend wearing nailpolish.
(As long as it's mine.)

Hip and logical don't always go hand in hand.

Men Color Frances

My parents wanted me to be a doctor. (I hope they're not too depressed I ended up the President of Hard Candy Cosmetics.)

It's In Your Wallet,
It's In Your Life."
It's Everywhere You Want To Be."

**VISA** 

RANKITWWW. rankit.com

Visa Purchases
Rite Aid 492,80
(Surprisingly, most
of that was spent on cotton balls.)

Oliver Reoples \$300.00 Sunglasses,
Fred Segal - Expensive shiny parts.

Saks Fifth Avenue \$495.00 Shoes Shoes. Shoes.

In not shallow, I'm a shopaholic.

#### **Dapper Snapper**

The DCS 520 digital camera snaps 3.5 images per second and has dual PC card slots. It's so good, it's the preferred camera of AP photographers. **DCS 520**: \$14,995. Kodak Professional: (800) 235 6325, www.kodak.com/.



# Camon EOS:1 Kodak Professional DCS 520 Kodak

#### Phlat

If you're looking for more than just a pretty picture, this 50-inch widescreen television is the ultimate home-theater centerpiece and space-saver. The HDTV-ready plasma display is a mere 4 inches thick and weighs only 92 pounds. PDP-501MX: \$25,000. Pioneer: +1 (213) 746 6337, www.pioneerelectronics.com/.



#### Joypad

Twitch-finger gaming shouldn't be a brain boggler. Once you program the PC Dash, you can make Lara Croft do back-flips without any keyboard gymnastics. PC Dash: \$69.95. Saitek: +1 (310) 212 5412, www.saitek.com/.

#### Mixmaster

With a five-minidisc and three-CD changer, Aiwa's XR-H66MD sound system is a music-pirating factory. Lay down party mixes from CDs; then use the detachable minidisc player for grooving around town. XR-H66MD: \$700. Aiwa: +1 (201) 512 3600, www.aiwa.com/.



NEW IRONY SCUBA 200M.



MAYBE WE SHOULD HAVE MADE A LIMITED EDITION
TO AVOID RAISING THE SEA LEVEL.



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SPEED

# WWW Open GL

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# 3Dfx The Ultimate 3D PC Entertainment Experience

#### Best Hardware. Be

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3Dfx® Interactive offers the broadest set of performance 3D solutions on the market. From the pure 3D power of Voodoo<sup>2™</sup> to the breakthrough 2D/3D capabilities of Voodoo Banshee™, 3Dfx Interactive offers more speed, performance and compatibility than any other company. That is why 3Dfx is the accelerator of choice for top publishers like Electronic Arts and Activision and top computer manufacturers including Gateway, Compaq, Micron and Packard Bell.

This fall the hottest 3D PC games including Madden NFL 99 by
Electronic Arts, Quake II by id software and Half-Life by Sierra are available for 3Dfx's Voodoo
Technology. With support for
Microsoft s Direct 3D, OpenGL and 3Dfx's proprietary API GLIDE;
3Dfx Interactive's Voodoo Technology is already compatible with over 500 products currently on the market and that is just the beginning.

Look for the 3Dfx logo on leading 3D accelerators and computers to ensure you get all the power and compatibility that only 3Dfx can offer.





### You Oughta Be in Pictures

A desktop *Titanic* is still a few years away, but a home-brew *Xena* is possible today using all-digital tools. "Still, it isn't easy," cautions Bennett Miller, who shot the documentary *The Cruise* on digital video. In the end, Miller relied on an expensive Avid editing suite to complete the film. Kevin Rubio went a step further, using a workstation like the one below for his *Star Wars* spoof *Troops*. Although Rubio also used an Avid for editing, he added 3-D effects with the PC. Even with a fast machine, rendering monsters can take ages – not as long, however, as waiting for a monster movie deal.

#### Digital Video Camera and Steadicam

Featuring broadcast-quality video, the XL1 is the only DV camcorder with interchangeable lenses. And the DV Steadicam takes the shakes out of your footage. **XL1 Digital Video Camera**: \$4,699. Canon: www.canondv.com/. **DV Steadicam**: \$1,395. Cinema Products: +1 (310) 836 7991.

#### Speakers

Hear how your work sounds on a pair of high-quality speakers. **SoundMan Extreme**: \$149. Logitech: +1 (702) 269 3457, www.logitech.com/.

#### Storage

The drive array stores video as data, ready for your workstation to process. Trimm's stylish unit holds the equivalent of 56 disk drives. **Trimm RAID Array**: \$5,000-\$14,000. Distributed by Avnet: (800) 424 3422, www.trimm.com/.

#### Workstation

Any fast Windows NT workstation will edit video and create special effects, but Intergraph adds its own graphics card and components to this dual-processor machine. And the 21-inch monitor gives you plenty of space to work. TDZ 2000: from \$2,610. Intergraph: +1 (256) 730 5441, www.intergraph.com/.





#### **Video Monitor**

See how the video will look on television screens across the nation. **PVM14M2U**: \$1,235. Sony: www.sony.com/.

#### **Wireless Microphone**

Lectrosonics makes a great interferenceproof wireless-mike setup. **Wireless transmitter and receiver**: \$2,035. Lectrosonics: +1 (505) 892 4501, www .lectrosonics.com/.

#### **Furniture**

+1 (415) 882 7147; Blu Dot :+1 (612) 782 1844, www.bludot.com/.

Emeco Aluminum Chair: \$259. Limn: +1 (415) 543 5466, www.limn.com/.

Perf Magazine Rack: \$50. Embellish: +1 (415) 882 7147; Blu Dot: +1 (612) 782 1844, www.bludot.com/.

Go-Cart Stacking Bookcase: \$440. Embellish: +1 (415) 882 7147; Blu Dot: +1 (612) 782 1844, www.bludot.com/.

Ben Pendant light: \$300. Resolute: +1 (206) 343 9323.

Chicago Desk: \$800. Embellish:

body double for CG dinos while filming Jurassic Park. Kevin Rubio used a Nissan to stand in for his computer-enhanced sand crawlers. **Tennis balls et cetera**: free. Garage: www.yourgarage.com/.

#### Camera Case

The many pockets of Lowepro's case will keep you organized on the set. **Magnum AW**: \$260. Lowepro: www.lowepro.com/.

Total Price: \$19,232.



There's no such thing as a digital camcorder for So we made digital

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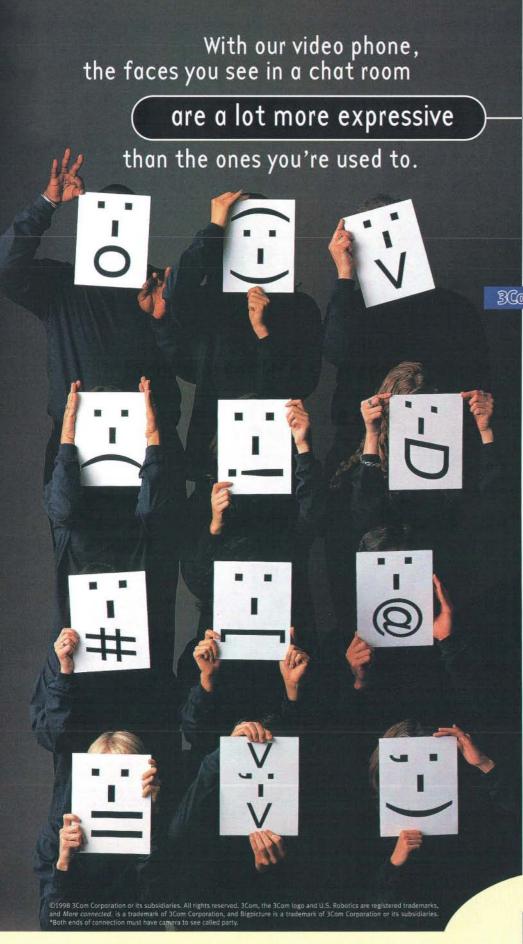
XL1

Canon

www.canondv.com

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#### **Rock and Roll**

For hardcore gamers, nothing beats the Intensor: Five speakers please the ears, and 108 decibels shake the chair to rattle the spine. **Intensor**: \$600. BSG Labs: (800) 274 5227, www.bsglabs.com/.



#### **Photo Finish**

The ColorShot digital photo printer spits out pics from scanners, digital cameras, and the Internet in just 15 seconds. The finished product is a clear, true-color photo in the familiar Polaroid instant-film format. **ColorShot**: \$299. Polaroid: +1 (781) 386 2000, www.polaroid.com/.



#### **Bottom Line**

High tech has finally come to the commode. The Zoe Washlet toilet seat attacks bathroom odors with an onboard air-filtration system. Cold? Turn on the throne's warming feature. Then opt for the remote-control-triggered bidet. **Zoe Washlet**: \$699. Toto: +1 (770) 282 8686, www.totousa.com/.

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Think of it as a reusable roll of digital film. The 8 MB card holds 25 to 120 images.

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KODAK Inkjet Photo Paper

Means you can get the printing quality you expect from Kodak without ever leaving home. Simple Computer Connection

Hook the camera up to your computer so you can print your pictures or e-mail them to friends and family.

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PC Connection



### Studio Apartment

Sure, you can tote your gear down to a rented music studio, but that's almost as irksome as lugging your dirty drawers down to the laundromat. Who wouldn't want to have all the necessary equipment in the privacy of their home – so you can work in your underwear? Of course, putting together a home recording studio will cost you a few dollars more than your average Maytag, but if you're a hardcore musician, it's well worth it. Here are a few ideas to get you started.



(408) 996 1010, www.apple.com/. **Pro Tools PowerMix**: \$795. Digidesign: +1
(650) 842 7900, www.digidesign.com/.

#### Preamp

The dbx 586 preamp converts analog signals to digital, and two vacuum tubes inside add warmth to your sound. dbx 586: \$999.95. dbx: www.dbxpro.com/.

#### DAT Recorder/Player

Record a master tape or, in long-play mode, save four hours of audio on a 120-minute DAT. DA-30 MKII: \$1,599. TASCAM; www.tascam.com/.

#### **CD-R Drive**

Make a master CD or burn copies for your friends; this recordable-CD drive allows you to preview your work before it's etched in, er, plastic. CD-R55SE: \$399. TEAC: +1 (213) 726 0303, www.teac.com/.

#### Amp

The 5/1500 amplifier sports 5.1-channel Dolby Digital sound and five monoblock amplifiers, making it a great component for your studio or even your home theater.





These 900-MHz wireless speakers work even 100 feet from their base, so they can be easily moved from the studio to the patio. WRKW1000: \$279.95. JBL: (800) 336 4525, www.jbl.com/.

#### **Furniture**

Scissor Work Table: \$1,200. USDA: (800) 681 8732.

**Updated Eames Aluminum Chair:** \$1,465.Limn: +1 (415) 543 5466, www.limn.com/.

Zen Table Lamp: \$210. Limn: +1 (415) 543 5466, www.limn.com/. Duo Paper Bin: \$39.95. Pablo: +1 (415) 822 2712.

614 bookcase: \$2,095. USDA:

(800) 681 8732.

Aluminum Bullet No. 101 lamp: \$280. David Weeks Lighting: +1 (718) 596 7945.







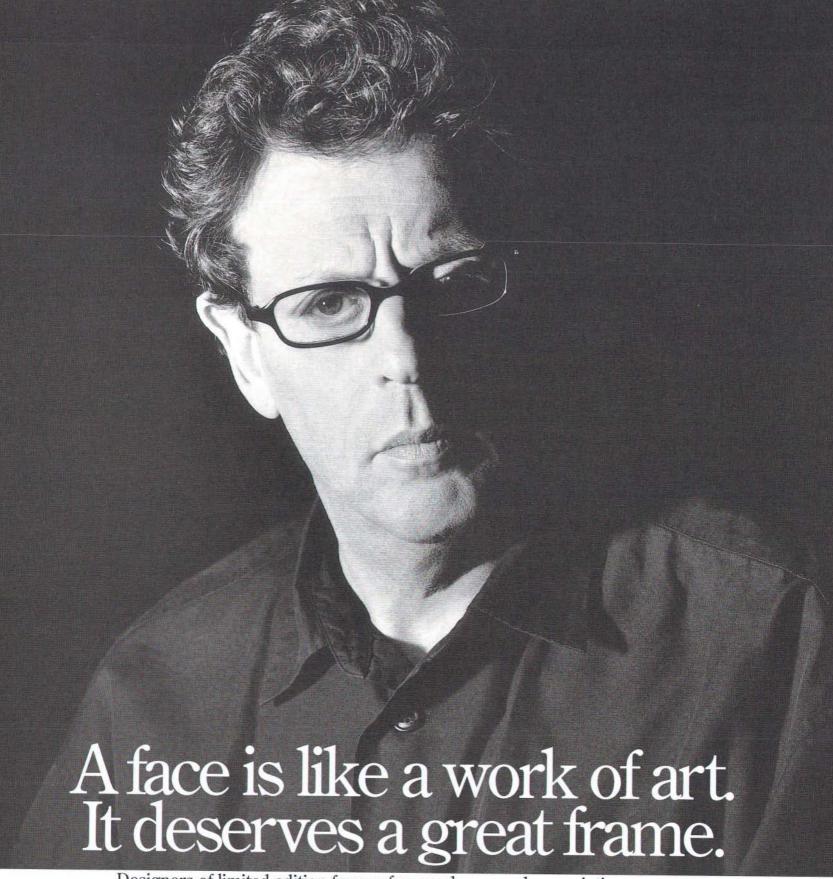
#### **Harmonic Convergence**

The Harmony CD player's diminutive size is misleading: The loudspeakers and subwoofer belt out big, crystal-clear sound. **Harmony**: \$449. JBL: (800) 336 4525, www.jbl.com/.



#### Night-light

Using photovoltaic cells that store energy during the day, the Solar Bud outdoor lamp powers up and glows red when the sun sets. **Solar Bud**: \$135. Luceplan: +1 (212) 989 6265, www.luceplan.com/.



Designers of limited edition frames for sunglasses and prescription eyewear

# I.a. Eyeworks





The latest fitness craze of the stars is part mountain bike and part rowing machine. Crafted by Rollerblade inventor Scott Olson and used by Kevin Costner, the Rowbike's guaranteed to burn at least 850 calories per hour. Rowbike: \$599. Sky Fitness: +1 (612) 442 7046, www.rowbike.com/.



#### Neoclassico

You can't blame fans for being skeptical of Ducati's decision to redesign the classic 900SS. But it's clear from the new look that this fuel-injected, 80-horsepower, V-twin road hog just keeps getting better. Supersport 900: \$10,995. Ducati: (800) 231 6696, www.ducatiusa.com/.



With patented independent suspension and a top speed of 65 mph, the Formula 50 scooter performs more like a motorcycle. The Guggenheim even included it in the Art of the Motorcycle show. Formula 50 LC: \$3,990. Italjet USA: +1 (516) 427 9234, www.italjetusa.com/.





Want to rip up the dirt and recover on pavement? Then check out Independent Fabrication's cyclocross bike - a steelframed rig that works well on singletrack trails and paved highways. Planet Cross: \$2,180. Independent Fabrication: +1 (617) 666 3609, www.ifbikes.com/.





THE BOMBAY SAPPHIRE MARTINI. AS DECORATED BY ANDRÉE PUTMAN.

POUR SOMETHING PRICELESS.



#### Anyware, Anytime

For multimedia work, you can't beat the Tecra 8000. This laptop features a 266-MHz Pentium II and a 13.3-inch active-matrix screen, as well as DVD compatibility, support for Dolby AC-3, and MPEG-2 decoding hardware. **Tecra 8000**: \$3,799. Toshiba America: (800) 867 4422, www.toshiba.com/.





#### Call of the Wild

Pick your pest. Press the corresponding button on this repeller, and the critter will scurry away. Future models, one hopes, will include a button for door-to-door solicitors. **Dual Speaker Push Button Repeller**: \$100. Brookstone: +1 (573) 581 7777, www.brookstoneonline.com/.

#### Insecurity Alert

In case an annoying siren isn't enough protection, a pager built in to this car security system allows you to phone your auto to unlock the windows and start or — in the event of a carjacking — turn off the engine. IntelliPage: \$695 plus installation. Clifford Electronics: +1 (818) 709 7551, www.clifford.com/.

#### Put It in Ink

Note taking might've been a casualty of the paperless office if not for the CrossPad. The digital notepad transfers handwritten notes directly to your PC. CrossPad: \$399. Cross Pen Computing Group: +1 (401) 333 1200, www.cross-pcq.com/.

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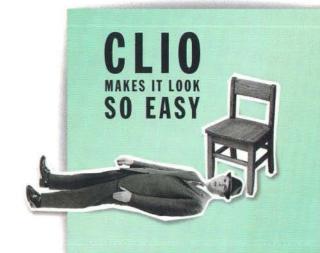
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Clio is the new PC Companion designed by Vadem and featuring Microsoft<sup>®</sup> Windows<sup>®</sup> CE, H/PC Pro Edition Software, version 3.0. It will bring more flexibility to your life away from your desk than you ever thought possible. Clio lets you seamlessly extend your office with just the essential files, information and applications you need—calendar,

contacts, e-mail, and Pocket versions of your favorite Microsoft productivity apps. Clio's built-in modem, e-mail and web browser let you keep up with the world back at the office. And the patented SwingTop" design gives you the flexibility to use it in three different configurations with either the touch-type keyboard or CalliGrapher\* natural handwriting input.

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#### The Small Mall

Popular culture was enthralled by all things small well before Q outfitted James Bond with wee weapons of mass destruction. Maybe it's the engineering feat, the portability, or the fact that they're so darn cute. No matter. The more shiny tiny toys you carry around in your pocket, the more you'll feel like a secret agent, man. Here are a few petite tools destined to grow on you.

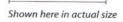
#### Shutterbug

The PalmCam is the smallest digital camera available. It takes high-resolution images and comes with a flash that can be detached to make it even smaller. **PV-DC1580 PalmCam**: \$599. Panasonic: (800) 211 7262, www.panasonic.com/.

#### **Small Talk**

Since the StarTac analog phone, Motorola has been the leader in small communicators. Now the company's mobile units come in digital varieties and still weigh less than 3 ounces. **StarTac V-Series**: \$500-700. Motorola: (800) 331 6456, www.motorola.com/.









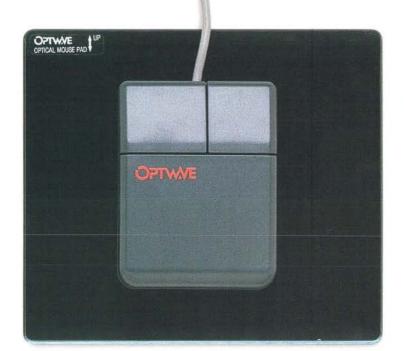
#### **Shot Glass**

Steiner packs stellar optics into a 3-ounce package you can tuck into your jeans pocket. With this 8X monocular, you'll feel like your sitting courtside — even from the cheap seats.

Mini-Scope: \$199. Steiner: +1 (609) 866 9191, www.pioneer-research.com/.









#### **Runt of the Litter**

This miniscule mouse fits easily in a carrying case and, though it seems too small, works efficiently, using an optical system to measure movement around the pad. OptWave: \$50-70. Sankyo: +1 (561) 998 9775, www.sankyo.com/.



#### **Short-Term Memory**

SanDisk's flash-memory card acts like a replaceable hard disk for a cell phone, camera, or PDA. Use the 96-Mbyte card with your camera, and snap hundreds of pictures before running out of room. CompactFlash: under \$500. SanDisk:

+1 (408) 542 0500, www.sandisk.com/.



It's flashy enough to wear as jewelry, but Motorola's Jazz is a serious pager, delivering text messages hundreds of words long. Jazz: \$149. Motorola: (800) 548 9954, www.motorola.com/.





#### **Up Your Sleeve**

This wrist camera by P3 International hides under a shirt cuff and uses standard 8X11 cartridge film. As long as no one asks you for the time, you're safe. Professional Wrist Camera: \$1,995. P3 International: +1 (212) 741 7373.

#### Leatherette

The Swiss Army has nothing on Tim Leatherman. Even handier than the inventor's larger unfolding creations, the Micra fits on your key chain. Micra: \$25. Leatherman: +1 (503) 253 7826, www.leatherman.com/.













# Your PDA lives in a hostile environment

The briefcase jungle of laptops, keys, and cell phones can be hazardous to the health of your hand-held computer. Give it the best care possible. Protect it with the new PDA Survival Kit, containing four essentials to make it last longer and work better.

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The sterling silver Fingertip Stylus improves writing accuracy and makes using your hand-held a lot more fun.

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Compatible with: PalmPilot™ Palm III™

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#### Housequake

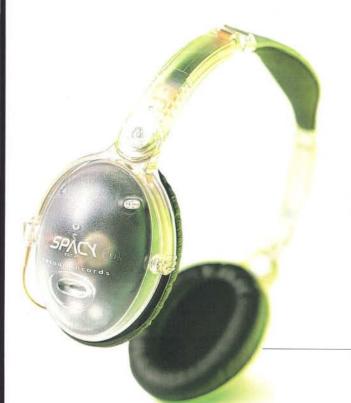
You could collect components for years and never approach the sonic boom of this home-theater system. With 5.1-channel Dolby digital and 80 watts of power, the YHT-31 makes raptors sound like earthquakes. YHT-31: \$999. Yamaha: +1 (714) 522 9105, www.yamaha.com/.

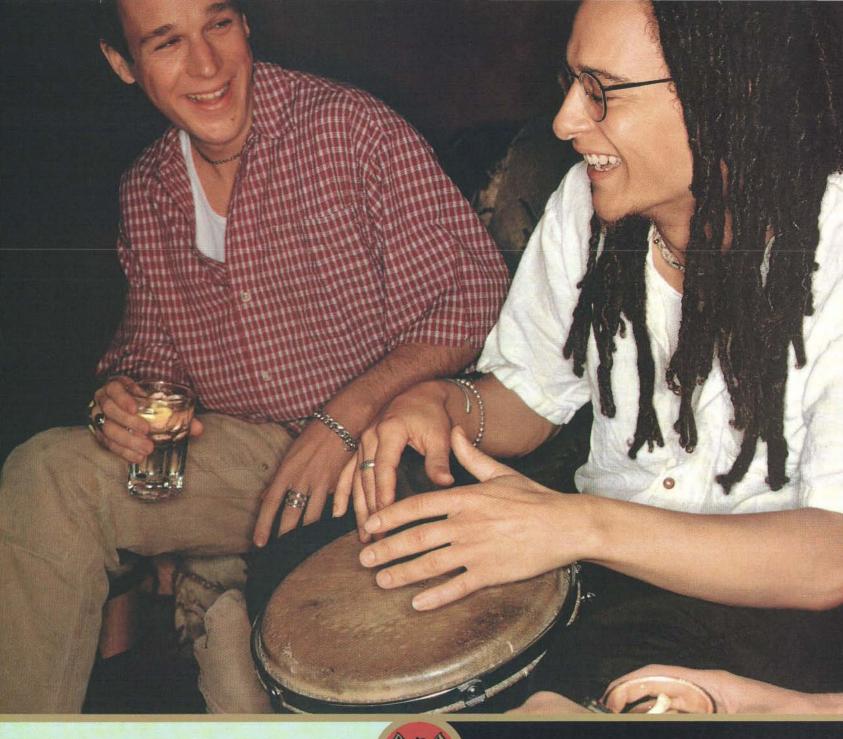


The profoundly deaf will like the sound of this device: A cochlear implant sits in your inner ear, the processor rests on a belt, while the headpiece tucks away neatly behind the auricle. Clarion S-Series Speech Processor: \$6,000. Advanced Bionics: +1 (818) 362 7588, www.cochleatimplant.com/.

#### Mellow Orange

Spacy's lightweight adjustable headphones add style to any stereo. Wear the semitransparent gear in sunlight, and the plastic casing turns orange. **Spacy Headphones**: \$60. Vacuum Records: +(81) 6251 7171, www.osk.3web.ne.jp /~vacuum05/head.html.





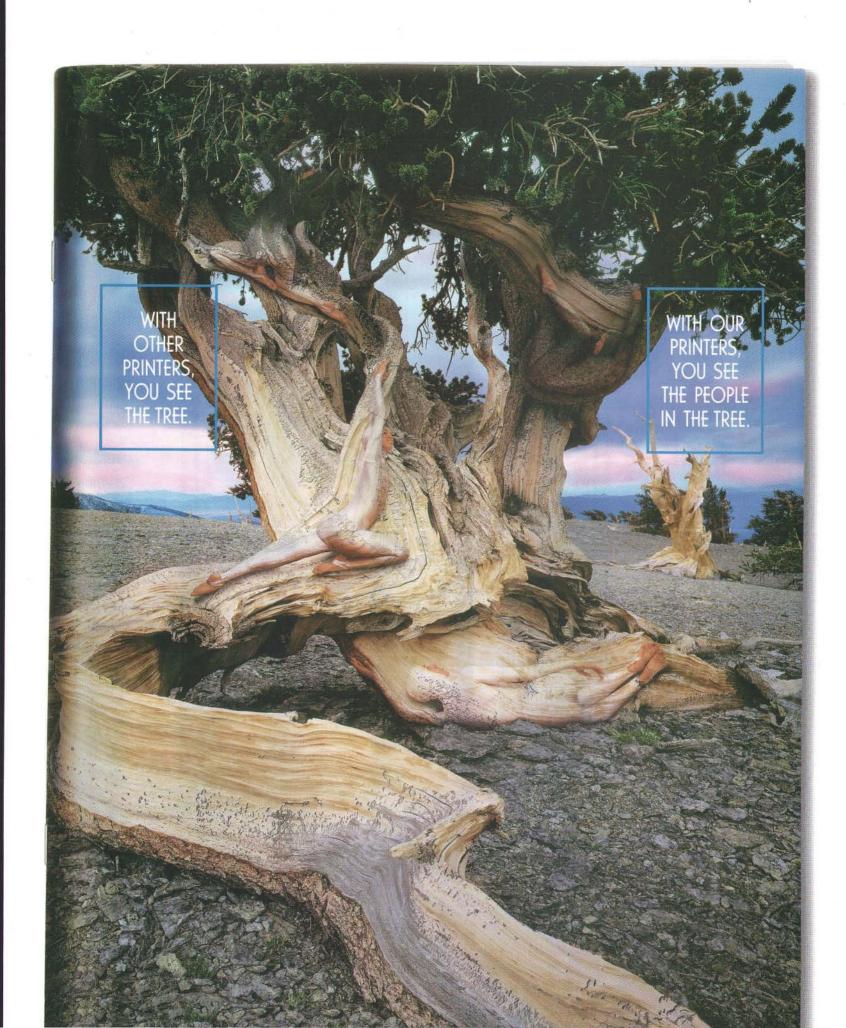
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Our 1440 dpi is what lets you see them. How many can you find? Two? Three? These amazing dancers are now appearing before your eyes courtesy of another incredible performer. An EPSON Stylus\* Color printer with 1440 dpi. No detail escapes it. Even the most subtle, like those on this program cover for a piece called "Chameleons." Of course with other printers, you might see how well these dancers blend in. But with ours, you see how much they stand out. All four of them.

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Only Epson\* ink jet printers have the exclusive PerfectPicture\* Imaging System for: 1440 x 720 dpi • Micro Piezo\* technology for a cleaner, more consistent dot • Quick-drying inks • Up to 9 PPM black on the Stylus Color 850 • PC and Mac compatibility • Optional internal ethernet • For more information, call 1-800-GO-EPSON (ask for Operator 3064) or visit www.epson.com.

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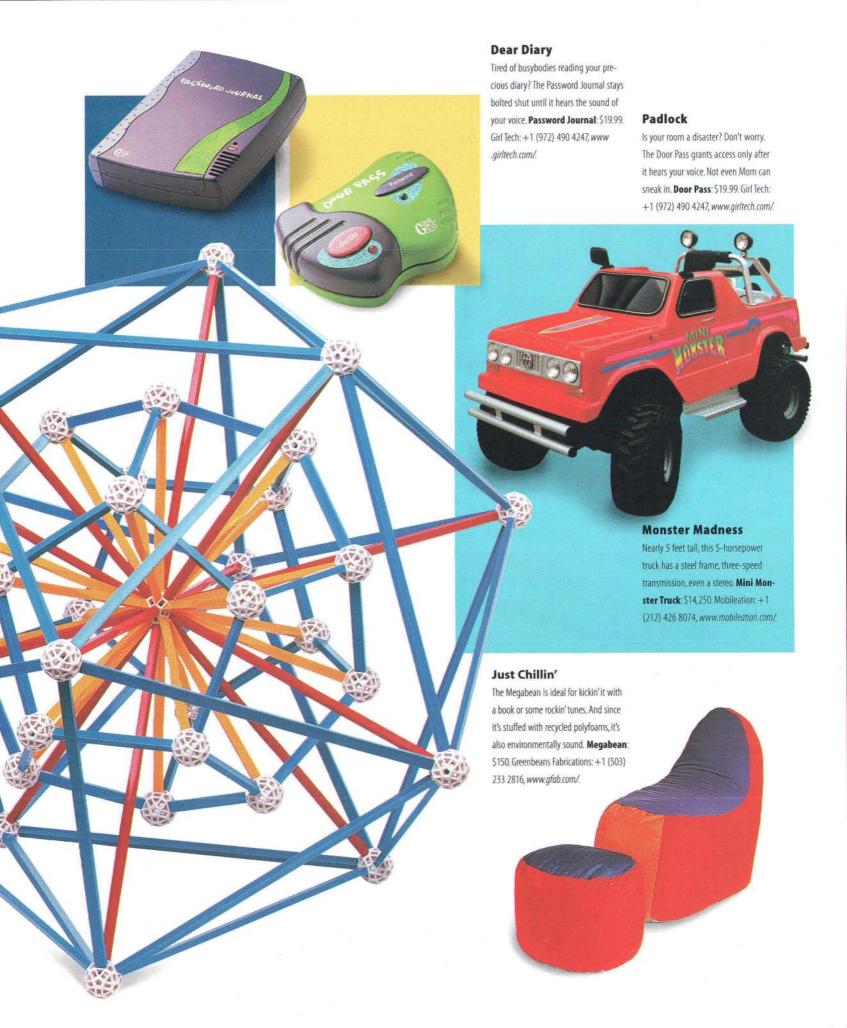


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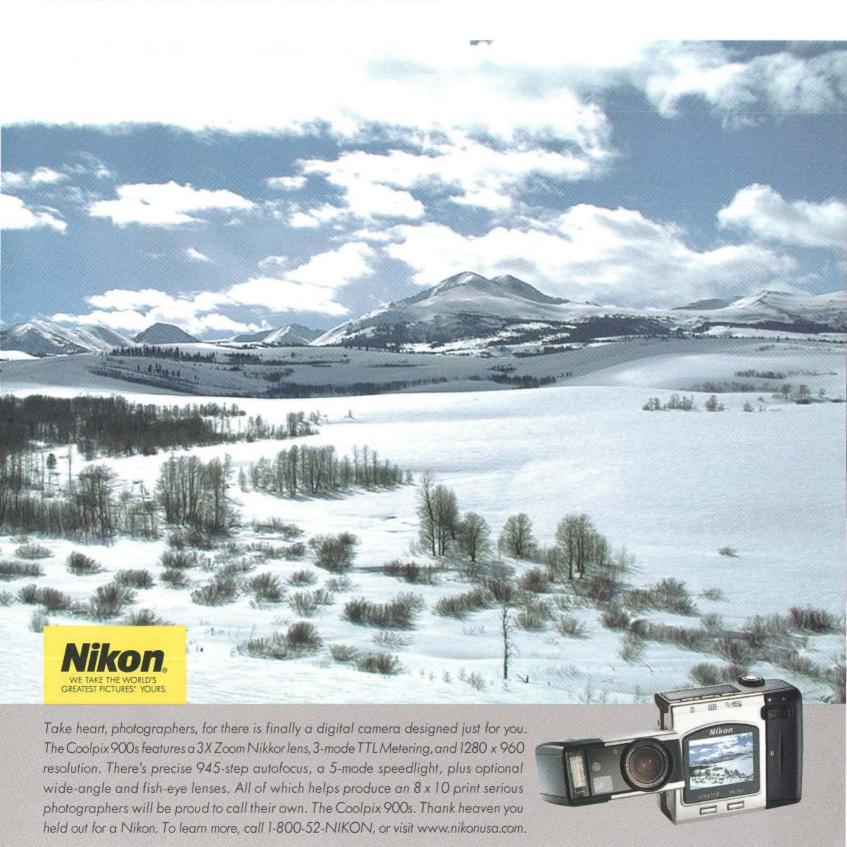
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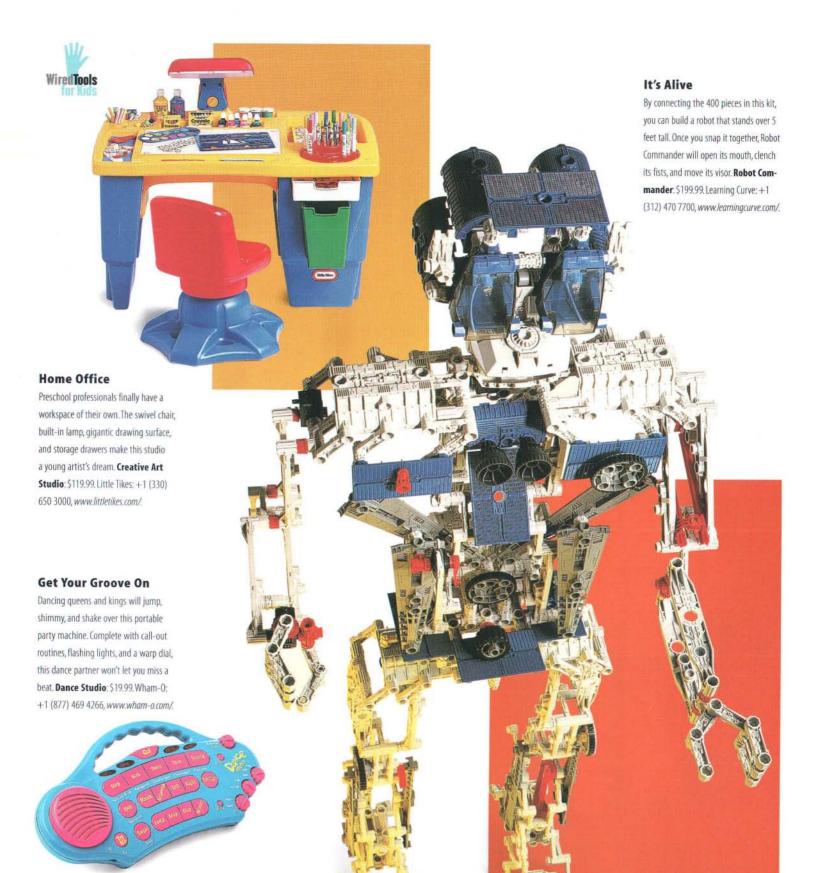


IF YOU THOUGHT YOU'D CONSIDER

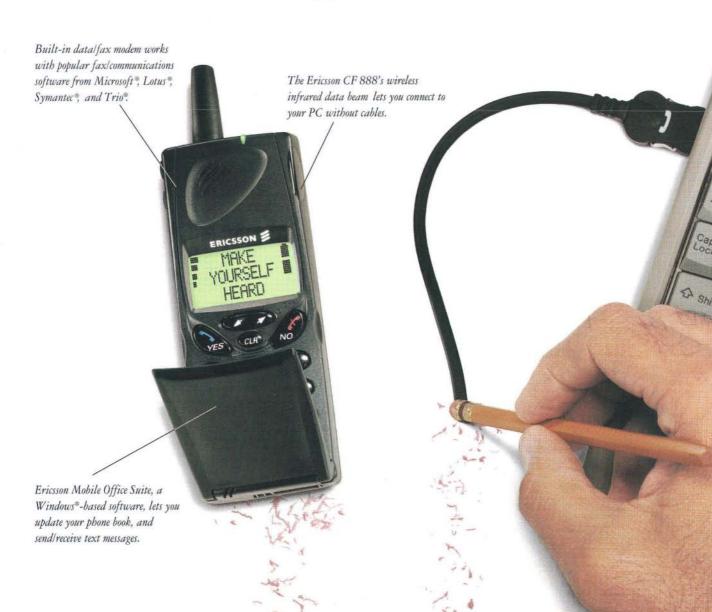
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Check out the DI 27, Ericsson's family of GSM 1900 mobile phones and Ericsson Original Accessories at Omnipoint, Powertel, Western Wireless or Pacific Bell Wireless.

# Remote control.



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It's new. It snaps on in seconds. It turns any Ericsson 600 or 700 series GSM 1900 phone and your laptop or PDA into a truly wireless

office. So you can check e-mail, send/receive faxes and surf the Net without wires. It's only from Ericsson, a world leader in

digital phones. It's the Ericsson DI 27. Want to go wireless? Call 1-800-ERICSSON for more information.



#### **PCs for Peewees**

With Net surfing in the '90s growing faster than television watching in the '50s, two-thirds of America's children are using a PC at home or in school. From laptop look-alikes that teach spelling to fully functional systems, here's a sampling of computers for precocious preschoolers, kindergarten wunderkinds, and grade-school scholars.



ages 5 and up

#### **Junior Computer Gold**

Helps kids with basic word and math skills and includes a working calculator and mouse. \$49.99. Team Concepts: (800) 486 0898, www.team-concepts.com/.

ages 8 and up

#### **Webstart Computer**

Introduces kids to Web surfing and email through a hyperlink-filled interface. \$99.99.Tiger Electronics: +1 (847) 913 8100, www.tigertoys.com/.



ages 3 and up

#### Barbie Online Talking Laptop

Styled like a real laptop — features an operating keyboard and a play mode that simulates Web surfing. \$24.99. KIDdesigns: +1 (732) 382 1760, www.kiddirect.com/.



ages 9 and up

(Viece)

#### The Equalizer

Combines wordprocessing and spreadsheet applications, email capability, and interactive tutorials: \$299. Vtech: +1 (847) 215 9700, www.vtechkids.com/.





#### ages 5 to 8

#### **Headstart Computer**

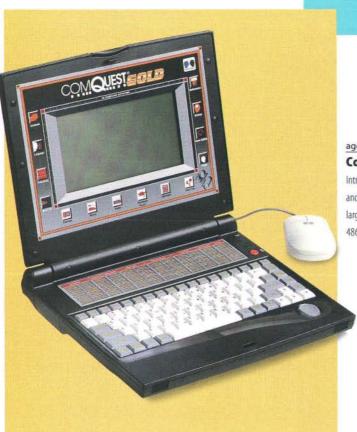
Uses a vocabulary of 450 words to tutor kids in spelling, homonyms, and rhyming. \$50. Tiger Electronics: +1 (847) 913 8100, www.tigertoys.com/.



#### ages 7 and up

#### **Hello Kitty Computer**

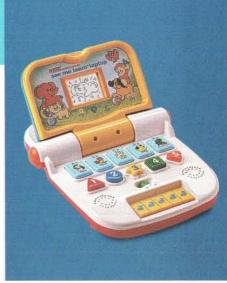
The famous feline graces the case of this fully functional pink laptop. ¥248,000 (about \$1,700), Sanrio: +1 (650) 952 2880, www.sanrio.com/.



#### ages 9 and up

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# HotMale

### Sabeer Bhatia started his company on \$300,000 and sold it two years later for \$400 million.

So, is he lucky, or great?

#### By Po Bronson

rom the first moment I met him, Sabeer Bhatia has given credit to the power of the idea. The idea was so powerful that when his friend and coworker Jack Smith, who was driving home to Livermore, called Sabeer on his car phone to brainstorm the pregnant thought that had just occurred to him, Sabeer heard one sentence of it and said, "Oh my! Hang up that cellular and call me back on a secure line when you get to your house! We don't want anyone to overhear!"

It was so powerful an idea that when Jack Smith

did call Sabeer back 15 minutes later, their minds melded as they talked, completely in sync, leaping from one ramification to the next as simultaneously as the steps of two soldiers marching side by side. It was so powerful that sleep that night was impossible for Sabeer Bhatia, with the idea now in his head, exploding, autocatalytic, a bonfire of the mind. He stayed up all night writing the business plan, which he brought to his day job the next morning to show to Jack, looking so

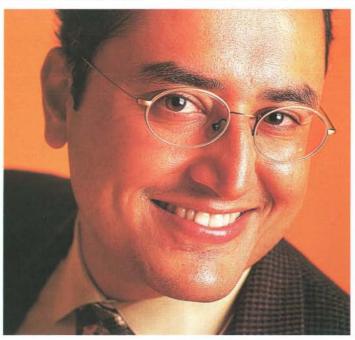
haggard that his boss stopped him and said, "You've got to cut out the partying, Sabeer," and Sabeer – afraid the idea might pop out of his mouth if he opened it at all – just nodded. He was afraid even to make a single photocopy of the plan he had printed out, lest a stray page find its way into the recycling bin and then into someone else's gaze.

This idea was so inspirational because it seemed like an idea *anyone could have*. It sent the message and CC'd the entire world: To make it here in Silicon

Valley, you just have to come up with the right idea. You don't have to know the right people. You don't have to demonstrate proven experience. Just have an idea.

That was in 1995.

Nowadays, meet Sabeer at a party and ask what he does, and, just like hundreds of thousands of other young people in the Valley, he will tell you only that he works in high tech. Push him for more detail and he'll say he works at Hotmail. Ask if he's an engineer and he'll say no, he's the president.



"He had hallucinogenic optimism," a VC says of Sabeer.

"But he was right. He grew the subscriber base faster than any company in the history of the world."

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He's not being reclusive or coy - it just hasn't sunk in that he might be special.

his fall, Sabeer Bhatia invited me to sit in on one of his Tuesday-afternoon strategy sessions with his senior managers. We met at his headquarters, in the asphalt jungle of Sunnyvale, California, in an anonymous low-slung office building. Sabeer is just 29 years old and has a very regal air – a deep listener. He doesn't interrupt and he doesn't interrogate or flex his power – if he wants to raise a contrary opinion, he will utter benevolently, "Does anyone question that the search box should be on every page?" Gentle giant. He wears chambray shirts over a stocky frame, and metal-rimmed eyeglasses.

In just under two and a half years, Sabeer has built Hotmail's user base faster than any media company in history – faster than CNN, faster than America Online, faster even than the audience grew for *Seinfeld*. Truly mindboggling. Hotmail provides free Web-based email directly to consumers; with 25 million active email accounts, the company has been signing up new users at a rate of 125,000 a day. Sabeer's company is in fact the originator of Web mail and the runaway leader in

apartments. His humble apartment has a bachelor-pad decor, with unadorned white spackled walls, a framed print leaning against the living-room wall, a rug rolled up off to the side. His living room has a 180-degree panoramic view of other units, but if you stand in one particular place and stretch your neck, you get an actual view of the shallow end of the communal pool. It's definitely not the place I expected from a man who's worth more than a hundred million dollars.

Why hasn't he bought a house? Is it that he hasn't had time to look?

"They're just all so overpriced. I think I'll save a little money if I wait until they come down."

he mold has been broken.
Every preconception of what it takes to lead a company has been shattered by the Internet culture – and there is no better example of this truth than Sabeer Bhatia's rocket to stardom.

Just over 10 years ago, on September 23, 1988, Sabeer arrived at LAX at 6 p.m. His flights from Bangalore, India, had taken 22 hours, and he was starving. Caltech, which had offered him a very rare transfer schol-

power Systems designing Power PCs, every morning Sabeer would come to his pal Jack Smith and tell him yet another story of some guy who'd sold his company for millions. "Jack! What are we doing here, wasting our lives!?"

So in August 1995, Sabeer began shopping around a business plan for a Net-based personal database called JavaSoft. This would become, in effect, the front for the Hotmail idea. With venture capitalists skeptical of the software market - it was too hard to get good distribution and rise above the fray -JavaSoft wasn't likely to fly, but Sabeer kept showing the plan, and saving Hotmail for those VCs he'd tested and respected. Hotmail was such an explosive concept, Sabeer didn't want a less-than-ethical VC to reject him, then turn around and copy it. In order to keep the Hotmail idea under wraps, he and Jack Smith even put the JavaSoft name on the front door of their first tiny office in Fremont, California.

"It's almost embarrassing to admit," says Jack. "We thought we'd make money on the JavaSoft product while we evolved this new thing."

Sabeer's first presentation to Steve Jurvetson of Draper Fisher Jurvetson didn't start off well – Jurvetson was having the same problem with the database idea every other VC was. So, late in the hour, Sabeer was forced to play the Hotmail card. He mentioned it, ever so subtly, characterizing it as a marketing tool. ("Everyone who used Hotmail would wonder how we built it and come buy our JavaSoft tools.") Jurvetson wasn't fooled – he saw the pot of gold.

Is Sabeer lucky, or is he great?

Jurvetson remembers: "He brought in these revenue estimates showing that he was going to grow the company faster than any in history. We dismissed the projections outright, but he insisted, 'You don't believe we're going to do that?' He had hallucinogenic optimism. He had an unquenchable sense of destiny. But he was right. He grew the subscriber base faster than any company in the history of the world."

One might have presumed that since Sabeer had been rejected by 20 previous VCs and was virtually a nobody, he was grateful to accept Draper Fisher Jurvetson's \$300K on their terms. "He's the most interesting negotiator I've ever met," Jurvetson

## The room was aglow with the **anticipatory thrill** of riding this bullet train up the **revenue curve**.

the English language. On the second to last day of 1997 – his birthday – Sabeer sold his start-up to Microsoft, and with Microsoft's financial muscle, Hotmail's juggernaut appears unstoppable.

From the various managers at the Tuesday meeting, I learned about a new search engine and an ecommerce plan, instant messaging, and a sign-on system that could be leveraged online much as DOS and Windows are leveraged on the desktop. The room was aglow with the anticipatory thrill of riding this bullet train up the exponential revenue curve.

Later, Sabeer and I had a drink at his apartment in San Francisco's South of Market area. Bayside Village is a four-story, three-dimensional crossword puzzle of boxy arship, had sent him directions that said, merely, "Take a shuttle to campus," but Sabeer didn't know what a shuttle was. He was 19. In his pockets he had \$250, the limit Indian Customs allowed a student to take out of the country. He didn't know a single person in all of America – but he had something, maybe the *x*-factor gene, that drew him here.

Maybe it was that same x-factor gene that later compelled him, as an engineering grad student at Stanford, to go to the brown-bag lunches in the Terman Auditorium basement, where Steve Jobs and Scott McNealy and so many other entrepreneurs hammered home the message, "You can do it, too." He caught the bug. Later, buried in cubicles, working first at Apple then at a start-up called Fire-



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says. Tim Draper made the perfectly reasonable offer of retaining 30 percent ownership on a \$1 million valuation. Sabeer held out for double that valuation – their cut, 15 percent. The negotiations got nowhere, so Sabeer shrugged and stood up and walked out the door. His only other

to flash the number of subscribers every hour.

The product spread like the Ebola virus, each email being, in effect, an advertisement to its recipient for the service. Sabeer received a second round of financing from Doug Carlisle at Menlo Ventures. It was six months before the first tiny competition

### The product spread like the **Ebola virus**, each email in effect **an advertisement** for the service.

available option was a \$100,000 familyand-friends round that Jack Smith had arranged as a backup – not nearly enough money. "If we'd gone that route, Hotmail wouldn't exist today," says Jack.

Draper and Jurvetson relented; they called back two days later to accept their 15 percent. And Sabeer and Jack stretched that initial \$300,000 all the way to launching the service before needing a second round. On the day they launched, July 4, 1996, the pair wore beepers on their hips

appeared. It was nearly a year before Four11's RocketMail was launched. "By the time Microsoft figured it out," Sabeer says, "we had 8 million users."

hen Microsoft came bidding in the fall of 1997, they came as a small army. Six at a time, they flew down from Redmond and sat in Hotmail's small conference room across the table from Sabeer. They offered a figure, something that would have put tens of millions of dollars in Sabeer's

pocket. Sabeer rejected it, and they stormed out. A week later they were back, and every other week thereafter for two months. They flew him up to Redmond to meet Gates and have a little get-friendly conversation. At that point, it's easy to see it all as funny money – when you've got a week to think about it, it's hard to really see the difference between 50 million and 60 million. Are you really going to risk losing the deal for another 10 million?

Two stories floated around Hotmail as the talks went on. The first was that in AOL's early days, Steve Case had spurned a buyout offer from Bill Gates and gone on to grow it into a multibillion-dollar valuation. The second story was about PointCast, which had rejected a \$400 million bid from Rupert Murdoch's News Corporation but never made its technology pervasive on its own.

Sabeer took a straw poll among his investors to see what price they might be able to anticipate. Doug Carlisle's figure was the lowest: \$200 million. Privately, Sabeer had half-jokingly been saying he wanted a billion dollars, so he challenged Carlisle's figure: "You don't think we can





get more than that?"

Carlisle laughed and rolled his eyes. "Sabeer, if you ever reach even my figure, then I'm going to build a life-size bronze sculpture of you and put it in my front lobby."

Sabeer went back to Microsoft and asked for \$700 million. "You're crazy," the negotiators shouted, followed by a few expletives. "You're out of your mind! You've blown it!"

But Sabeer knew those were only tactical outbursts. As a kid in Bangalore, he had watched family servants haggling over groceries at the bazaar. He knew every trick. At the bazaar, vendors would counter a low offer by saying, "Oh, I'm sorry, is that all you can pay? You must be very poor. I want to give you a few rupees out of my own pocket so you have enough money to pay."

Tensions rose as Microsoft piled cash on the table, \$200 million, \$250 million. Carlisle took to saying, "It's statue time!" \$300 million. This negotiating squad seemed to have deep knowledge about RocketMail, Hotmail's competitor, and it was possible that Microsoft was negotiating to buy Rocket-Mail as an alternative. Or maybe they just wanted to scare Sabeer, to make him think Bill had another option. Sabeer, who had the go-ahead from his board and his management team to negotiate the deal himself, stood firm: no sale. Several times, Microsoft's negotiators stormed out. Even with the talks secret, Hotmail's employees twice pressured Sabeer to accept the most recent

don't have to sell now. Why don't you wait until you're big enough to buy Microsoft, rather than them buying you."

All the while, Hotmail kept signing up subscribers.

When Gates offered \$350 million, Sabeer's management team took a straw poll in favor of accepting. Now he really was alone.

"Saying no to so much money was the scariest thing I ever did," Sabeer says.
"Everybody had told me, "This is on your head if you screw it up."

On New Year's Eve 1997, the deal was announced. Sabeer is forbidden to publicly reveal the price, but the S-3 registration filed a month later stated that the ownership of Hotmail had been exchanged for 2,769,148 shares of Microsoft – at the time of the deal, worth a walloping \$400 million.

Throughout the Valley, the gut reaction was shock: No way was the company worth so much. \$400 million? For just email? Who the hell was this kid Sabeer Bhatia, and how the hell did he do it?

A year later that price looks cheap, particularly considering that Hotmail has more than tripled in size since it was purchased.

"In retrospect," says Steve Jurvetson,
"I'm not sure that a billion dollars wasn't
the right figure."

veryone around Sabeer Bhatia thinks he has proven himself a unique individual. "Best of class," says his partner, Jack I was amused by him. What set Sabeer apart from the hundreds of entrepreneurs I've met is the gargantuan size of his dream. Even before he had a product, before he had any money behind him, he was completely convinced that he was going to build a major company that would be worth hundreds of millions of dollars. He had an unrelenting conviction that he was not just going to build a run-of-the-mill Silicon Valley company. But over time I realized, by golly, he was probably going to pull it off."

These people have every confidence that if Sabeer were not here in Silicon Valley, he would be leading people somewhere. But Sabeer believes he's damn lucky to live in this place and time. "Only in Silicon Valley could two 27-year-old guys get \$300,000 from men they had just met. Two 27-year-old guys who had no experience with consumer products, who had never started a company, who had never managed anybody, who had no experience even in software – Jack and I were hardware engineers. All we had was the idea. We didn't have a prototype or even a dummied graphical interface. I just sketched on his whiteboard."

Not the case where he comes from. In India, Sabeer's mom worked her entire career at the Central Bank; his father spent 10 years as a captain in the army, then became a manager in several public-sector hierarchies. That was what life offered him. In India, kids like Sabeer grow up assuming that starting a company is impossible unless you're superhuman. Too much corruption and political risk undermine investor confidence in new ventures. "Here," says Sabeer, "you have a three-year moratorium on Internet taxes for electronic commerce. In India, ecommerce is actually illegal because of the 1885 Indian Telegraph Act, which forbids using telecommunications for profit. An 1885 law? Can you believe it?" His parents were horrified when he quit Apple, where they truly expected him to work for at least 20 years.

But Sabeer got swept up in the decade's fever: You haven't lived until you've gone solo. After a few years in the Valley, Sabeer discovered that the really successful businessmen were just ordinary guys – smart, but not unusually so. If they could do it, he could, too. And every day, at every turn, he got someone to buy into his vision.

# Typical reaction: **\$400 million?** For just email? Who is this kid, and **how the hell** did he do it?

offer and guarantee their security. Sabeer's venture capitalists, who stood to realize gigantic returns on their investments, urged caution.

But negotiating alone allowed Sabeer to present a unified front; it prevented Microsoft from taking Jack Smith to dinner and saying, "Jack, you've got a wife and a kid – c'mon, they'll be set for life." But Sabeer wasn't psychologically alone – his backers and colleagues kept the faith. VC Steve Jurvetson joked with Sabeer, "You

Smith. "He gives off the most tremendous vibe of passion," says Montrese Etienne of McLean Public Relations, which Sabeer convinced during the early days to accept Hotmail stock in exchange for its services. "Sabeer may have an ordinary background," says Doug Carlisle of Menlo Ventures, "but he's an extraordinary individual."

Sabeer's mentor, an angel investor named Farouk Arjani whom Sabeer met at a Valley organization called TIE (The IndUS Entrepreneurs), describes him like this: "At first Our customer support is so responsive that, oops, there's a call, gotta go.



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The first 12 Hotmail employees signed on entirely for stock, forgoing salary – not very common in the Valley, where the unemployment rate is nil.

Now think again of Sabeer's simple apartment in Bayside Village's plasticized neighborhood. See it in its psychological light: a reminder that he is the same person he always was, that he hasn't lost himself, that his values are in the right place.

At night he sits at home, reading the industry trade magazines, trying to digest the chaotic splendor of the Internet. That's his pipeline of strategic info. Just magazines, the same magazines you can buy. Available on any newsstand.

Sabeer even talks about Bill Gates, ordinary guy. "He is! He's human," Sabeer says. "He's very smart, but not superhumanly

a new Microsoft campus in Mountain View, where it will be joined by WebTV. Sabeer now reports to someone who reports to billg, and he flies to Redmond almost every week. His task as he has always seen it – getting his employees to believe that this company is theirs – is now a changed proposition. It's a harder story to tell, more complex to buy in to. "A different kind of person is optimized for this corporate environment," he explains. "The ideally suited person is career minded. Someone who can think for the department."

In the Tuesday management session I visited this fall, the topic of new business cards came up. The representative product manager from Microsoft said, in a remarkably matter-of-fact way, "It's really better if you don't put 'Hotmail' on the cards. Just before. (He had gotten his green card only a few months before launching Hotmail.) He wanted to talk about how India might be transformed. The level playing field of the Internet had convinced him that in the future, young, ambitious people won't have to leave home: "India is ready for the Internet revolution. In India, just to open a little restaurant, you have to get 18 permits, but you don't have to get a permit to start a business on the Internet."

Sabeer's vision for India involves TV. First, install a fiber-optic cable from London to Bombay. Second, use TV cable networks to provide local access points. Third, make available a sub-\$50 Net device, somewhat like WebTV's. He estimates the project would take about \$200 million to pull off.

It is a gargantuan vision, and it is based on the premise that his own greatness does not exist. Sabeer has convinced himself that he's just a product of Silicon Valley, and the very fact that he is dreaming such an extraordinary-sized dream doesn't even trigger the cognition that maybe he's just a tad more visionary than others.

"It's a herculean task," he admitted to me, "but the prospect of changing the destiny of a country motivates me."

I was witnessing what everyone said of the early days of Hotmail – Sabeer's unquenchable sense of destiny, his nearly hallucinogenic optimism. As a story, it amused me. It was easy to interpret his enthusiasm as a self-induced late-night fancy that would downgrade from quest to cocktailparty conversation in a few days. It was easy to look at it through the Freudian lens: Man returns home for his 30th birthday intent on saving other young men from the scar of having to choose between family and self.

But he was right that India is still a sleeping lion. Sabeer seemed tenacious about it. He'd set up numerous meetings with various officials, and after he had boarded the plane it occurred to me that, really, what the hell did I know? Wasn't it possible that I was watching history at its inception? I thought, "By golly, he might just pull it off." After all, it's a good idea.

Contributing editor Po Bronson (pobronson @aol.com) wrote "Someone's Got to Move Units!" in Wired 6.10.

### "It's the **nature** of this medium," says Sabeer, "that if something succeeds, it is **wildly successful**."

so. I remember meeting him the first time up in Redmond. I was nervous, and I spoke for too long. Then Bill started asking questions. They were normal strategy questions, the same things I'd been asked by investors all along."

oug Carlisle is holding true to his word about the bronze statue – a bust has been commissioned by an artist in Los Angeles. It's such an odd thing – celebratory of the individual rather than the company or the Internet. But Carlisle commonly offers his entrepreneurs such gifts when they reach milestones – a Porsche Carrera, say, or "If you make that, I'm going to kiss your shoes."

If anyone deserves it, I guess Sabeer does, but doesn't it make him uncomfortable?

No. "It is an honor. My hope is that, just as I was given inspiration at those brown-bag lunches in Terman Auditorium, when entrepreneurs come into this most prestigious address on Sand Hill Road, it will give them inspiration."

As of this writing, Hotmail has 144 employees, and it is one subdivision in a Microsoft superdivision called Web Essentials. Hotmail will move from its offices in Sunnyvale to put 'Microsoft.' Then, when you move around between divisions, which happens a lot here, especially with all the reorgs, you don't have to print new cards." And Sabeer had to just hold his poker face and avoid a grimace, knowing that he has to take such salt along with the sugar.

At breakfast one morning I asked Sabeer if he felt at all powerful, considering that he runs the world's fastest-growing media company. "That is such an odd, foreign concept to me," he said slowly, trying to think in that old paradigm. "When you say 'power,' that conjures to me control, such as having people do what I want them to do. It is just absurd. It is the nature of this medium that if something is a success, it is wildly successful."

he last time I saw Sabeer Bhatia, it was 1:50 a.m. on a Monday, and he was boarding a Korean Air 747 to start a 24-hour flight halfway around the world – first to Seoul, then on to Bombay. He would meet with business leaders in Delhi and later deliver a speech at Internet World there.

Sabeer had thought hard about what he wanted to say to the country he left 10 years

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# The Double Life Robert X. Cringely

Revelations of a Silicon Valley confidence man.

By Liesl Schillinger

n page 24 of Accidental Empires, his best-selling 1992 book about the birth of the PC business, Robert X. Cringely published the personal phone number of a renowned computer industry insider: himself. Between 1987 and 1995, Cringely wrote the "Notes from the Field" column for InfoWorld magazine, reporting on Silicon Valley's brave new world and the billionaire nerds who ran it. In so doing, he became the preferred confidant of the players that everyone in the industry wanted to know about. He was no Matt Drudge, he was a Boswell, judiciously praising and blaming the great men of the cyber age with one eye on history, one on human nature. He demystified the transistor, he opined on graphical user interfaces, he analyzed operating systems, he dished on undishy men like Paul Allen, Steve Wozniak, and Jim Warren.

He has also called Bill Gates a megalomaniac and

Steve Jobs a sociopath, comparing them – vis-à-vis each other's managerial auras – to Stalin versus Hitler.

In 1996, PBS aired a documentary of Accidental Empires called Triumph of the Nerds, and on camera, the players who had previously whispered their secrets to Cringely began to shout them. An IBM lifer, Sam Albert, sang a hearty IBM company fight song in duet with Cringely – and, famously, Steve Jobs

bluntly declared that he thought Microsoft made mediocre products, a salvo that caused a rift between Jobs and Gates. By last year, the two men had mended fence. Gates gave Apple \$150 million, and Apple and Microsoft shook on a joint licensing agreement.

Yet in Cringely's new PBS documentary, *Nerds 2.0.1:* A Brief History of the Internet, which premieres November 25, Jobs again spoils for trouble, saying the Web is "exciting" chiefly because "Microsoft doesn't own it, so there's an incredible amount of innovation going on."

Why do they all open up to a man who concedes that he is "just a little bit dangerous"? Cringely knows why. "I've been on the periphery of the room in every room they've ever been in, and I've been asking questions for 20 years," he says. Besides, he explains, "Bill likes our interviews because I don't bore him, and that probably is true for Steve as well."

With his uncanny ability to appear ordinary, Cringely has become the preferred confidant of Valley players like Christine Comaford.

This is not to say that Cringely doesn't sometimes get on people's nerves. He has been flamed by WebTV grannies who resent his dismissal of their high tech toy, and by "very, very fervent" Macintosh users who resent any criticism at all. Cringely was thrilled when Gates tried to disprove an anecdote from Accidental Empires. In the book, Gates goes to a convenience store in 1990 (net worth at the time: \$3 billion) to get

# One has a history of awards. The other is making history.



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a tub of butter pecan ice cream. At the checkout counter, he can't find a 50-cents-off coupon he had brought, and as he searches and
searches, a frustrated customer farther back
in line finally tosses him two quarters, which
Gates takes. The customer calls out, "Pay
me back when you earn your first million."
Gates told Cringely the story couldn't be true
because coupons come in the daily newspaper, and he doesn't get a daily newspaper.
"He wanted me to buy it!" Cringely marvels.
"Why? Who am I to him?"

s it happens, Bob Cringely is not really Robert X. Cringely - or rather, he is not the only Robert X. Cringely. He was born Mark Stephens, and grew up in Apple Creek, Ohio. His mother was a librarian, his father was a labor union organizer, and he has an older brother and a younger sister, who both work in the computer industry today. Cringely built two small planes with his father before he was 14, and as a teenager, he decided he wanted to study in England, and found himself a scholarship to a tony old boarding school near Liverpool called the Merchant Taylors' School. He got his pilot's license there as part of the school's compulsory military training. "British tax dollars paid to teach me to fly," he gloats.

named Katy Gurley, in an idyllic tudor stucco house on a leafy street in Burlingame. He works in an office in San Mateo, 10 minutes away by car – by his 11-year-old Honda Civic, that is.

Cringely is 45, with brown wire-rimmed Armani glasses, shaggy dark brown hair, and the loping gait and rumpled wardrobe of an aging college student - pale beige cotton trousers and a purple tennis shirt. His office is one in a row of low, cookie-cutter buildings on a drab commercial strip, and it is attached to a long, high-ceilinged garage, where Oregon Public Broadcasting has filmed hours and hours of footage for PBS of Cringely gabbing and tinkering with his computers and his single-engine home-built planes. It is here that he runs his Internet start-up, Pronto, which does something so confusing and specific to streamline intercomputer communication that Cringely despairs of explaining it. It is also here that he writes his weekly PBS Web column "I, Cringely" (www.pbs.org/cringely/), works on his next book, which he has only recently gotten a bead on and would rather not talk about, and juggles calls from his editors, his publicist, his book agent, his speaking agent, and all the other people who think they need Robert X. Cringely's ear.

# wanting to be doubted. "Over the last 10 years, as *nerd* has taken on the connotation of successful businessperson, it has lost its sting," he went on, taking a sip of Slurpee. "In the last two years, *geek* has even lost its sting." Not that this has brought Cringely any

Massachusetts, kitchen. "A salade digitale,"

he specified. He had just wrapped a pilot

Cringely show, which premiered in October

on Britain's Channel 4. "I have a lousy life,"

he kvetched as we roamed his office, which

is covered in demure powder-blue wallpaper.

"I don't get enough exercise. I enjoy the air-

down on two big padded sofas, amid a metal

plane stuff but I don't fly enough." We sat

and paper furze of Diet Coke cans, maga-

zines left by British film crews, and copies

of his book in Japanese, French, German,

and Dutch. From the jumble, he singled out

one item for admiration: a yellow and aqua

plastic clicky pen that read, "Kitty's Cathouse:

Red Light District, Carson City, Nevada. Hot

Wild Kinky Sex." "It was a gift," he crowed,

Not that this has brought Cringely any closer to success. He still has no money, he likes to point out; he rents his house, he doesn't own a Lexus. Whatever you do, don't envy Cringely – his livelihood depends on it. As he wrote in his book, "It takes a failure – someone who is not quite clever enough to succeed or to be considered a threat – to gain access to the heart of any competitive, ego-driven industry." But there is method in his meekness, and he is luckier than he lets on. It is lucky, for example, that Mark Stephens is allowed to call himself Cringely, and to publish books, and narrate TV shows, under that name.

A million years ago, before there was a Robert X. Cringely, InfoWorld's industry column was written by a man named John Dvorak. When Dvorak departed, his byline left with him, and the editors panicked. As it happened, InfoWorld already had a fictional employee on the masthead, one Robert X. Cringely, who took the blame when things went wrong. Aha! The editors would turn their imaginary whipping boy into a permanent columnist; his name would live forever, no matter how many writers came and went. Most of the Cringelys who followed Dvorak served their term for only a short time. Stephens, who was the third Robert X. Cringely, was the exception; he stayed eight years - so long that Mark Stephens, who had worked

### The method to his **meekness**? "It takes a failure to gain access to an **ego-driven** industry."

Mark Stephens went to the College of Wooster, in Ohio, where he majored in physics, bowled, sang tenor in the choir, and chased girls. After graduating, he raced off to Northern Ireland and Beirut to cover foreign wars as a newspaper stringer, but by 1977, he had returned to America, married, and moved to California. He worked with Steve Jobs in the early days of Apple, and when Jobs offered him shares in the company as payment, Cringely held out for payment at \$6 an hour. "Let's not think about that," he says. He went to Stanford and got a PhD in communication research, but he tired of teaching, and in the late-'80s, he joined InfoWorld.

His first marriage ended along the way, and so did a second, and now he lives with his girlfriend, a former *InfoWorld* employee Some of those callers, even now, six years after *Accidental Empires* first came out, are new groupies who pick up his book, find his phone number, and dial it to see if it works. Cringely loves it when they do. "The most calls I've ever gotten was 13 in one day," he says. "It's flattering. If I'm here, I talk to them."

It is this ability to be, or rather to seem, an ordinary guy that is the source of Cringely's extraordinary success.

n a sunny Saturday afternoon this fall, Cringely had just returned from the East Coast, where he had been shooting a PBS special called *Digital TV: A Cringely Crash Course*, which would air November 9. He had interviewed Mister Rogers (they sang the song "Look and Listen" together), and made a salad with Julia Child in her Somerville,

as a foreign correspondent, earned a PhD, and even written a book on the Three Mile Island accident, fell by the wayside. When I tentatively called him "Mark," he laughed impishly. He will answer to either name, but professionally, he sees himself only as Cringely. "With my clothes on, I'm Bob," he said.

Unfortunately, in 1995, as PBS was editing Triumph of the Nerds, InfoWorld fired Stephens - which was sort of like firing Mary Ann Evans from being George Eliot. InfoWorld thought that it ought to have exclusive dibs on the Cringely name. (In a spooky twist, if anyone really owns the rights to the Cringely name, it is probably Cringely's girlfriend's father, who put an imaginary "Al Cringely" scapegoat on his PR firm's masthead decades ago. The surname was eventually imported by InfoWorld.) Cringely still feels the betraval deeply - first because, as he sees it, InfoWorld dismissed him without warning, and second, because they accused him of trademark infringement for continuing to use the name that he had done so much to build. "InfoWorld sued me," he says, still sounding incredulous. The case was settled out of court; InfoWorld kept the trademark,

and today, another scribe's Cringely column appears in its pages every week. But the company was ordered to pay Cringely's court costs, and he was given license to use the coveted name professionally – "As long as he doesn't use it in computer publications," *InfoWorld*'s editor, Sandy Reed, who fired him, clarifies. "PBS we don't compete with." The lowly Cringely, as ever, somehow came out on top.

ringely subtitled *Accidental Empires*"How the Boys of Silicon Valley Make
Their Millions, Battle Foreign Competition,
and Still Can't Get a Date," so it is tempting to
think that Cringely himself must be a socially
inept computer geek. This is the peer group
he has chosen to glorify, but anyone who
watches his quirky PBS documentaries can
see that Cringely, coasting down Highway
101 in a red convertible T-bird belting "Scarborough Fair," soaking in hot tubs with computer gurus, invading the castles of software
millionaires, flying a lemon yellow plane,
is no shambling, inhibited dweeb.

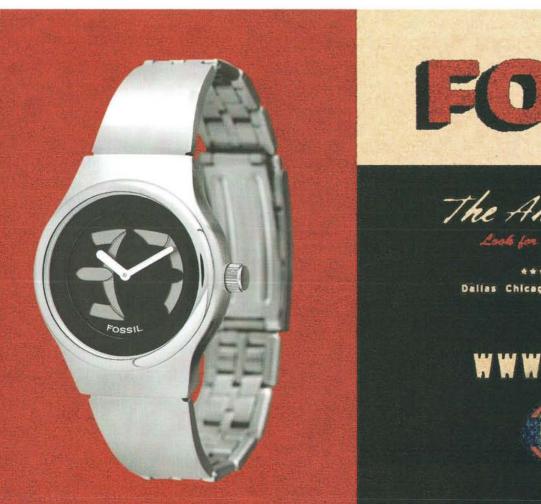
He has never been more user-friendly than he is in *Nerds 2.0.1*. He sings the national anthem in a booming voice at

a 3Com Park ballgame, interviews a cyber sex vixen, rides in grocery carts with webheads, and plays ultimate frisbee with Internet venture capitalists who shout at him in unison, "Sorry Bob, your idea sucks, we're not funding it!"

But during all the commotion, again and again, he also takes time to visit a young, blond bespectacled dweeb named Graham Spencer, the brains behind Excite. Cringely drops in on Spencer and his partners in 1994 in their junky garage "Architext" start-up, revisits in 1997, as they've become millionaires, and again in 1998, as they are moving into a corporate Magic Kingdom office complex. He visits them just to pay tribute.

What of his own start-up? Cringely humbly concedes he's probably going to have to relinquish control, "not just for financial reasons, but because I'm not qualified to run it." Poor Bob. Condemned to make his livelihood by chronicling the fabulous successes of others – and too harried to notice that they're giving him the time of his life.

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### IMAGE: JILL GREENBERG

## Data Row Podesta

Ten years ago the power matchmaker foresaw that
Silicon Valley and Washington would need each other.
Now they need him.

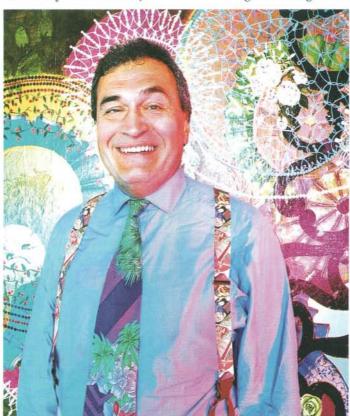
### By Sara Miles

ess than five minutes out the door of Washington,
DC's Old Executive Office Building, where he'd
been meeting privately with Al Gore's chief domestic
policy adviser, high tech lobbyist Tony Podesta broke
into a sweat, dashed across Pennsylvania Avenue,

and got busted.

Siren wailing, a police cruiser pulled to the curb, and a tightly wound cop wearing mirrored shades jumped out. "ID!" he barked. Podesta handed over his license. "You live here," the cop said in disgust, examining it. Podesta nodded. Dapper, as usual, in a pinstriped suit and a deliberately loud tie, he had already started to punch a number into his cell phone. "That's 'crossing as to create endangerment," the cop interrupted. He wrote out a \$5 ticket as slowly as possible while Podesta waited, steaming with impatience. "So tell me," the policeman asked, finally putting away his pad. "Do you always go that fast?"

In a word, yes. You might even say that Anthony T. Podesta, already among Washington's canniest and best-connected dealmakers (number 16 this year on *The Washingtonian* magazine's list of the city's 50 most



"He's a router," says a White House adviser. "I'm software," says Podesta. "I'm a server, I'm a switch." Whatever the metaphor, he's closing deals that leave everyone happy.

powerful lobbyists), is accelerating. At 55, he's a lifelong liberal Democrat with a small lobbying firm that brings in around \$7 million a year representing some of the most prominent corporations on Earth. His specialty: the difficult and often mutually mistrustful interface between informationage businesses and the world of Washington. His strength: a surprising ability to close the deal leaving everyone happy. It's an approach that resonates equally with businessmen steeped in the win-win jargon of negotiations and politicians deep in the pragmatic youscratch-my-back-I'll-

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scratch-yours conversations that make Washington run. Podesta appears to be the ideal matchmaker for any high tech company needing to do business on Capitol Hill, in the White House, or wherever regulation, trade, and government contracts are on the table. And these days that's just about everywhere.

Podesta Associates was launched in 1988 by Tony and his younger brother John, an expert on law and technology who had worked for the Senate Judiciary Committee. Over the years, Podesta Associates has forged close relationships with big firms like IBM and Genentech, while becoming increasingly sought after by new Silicon Valley players like WebTV. Podesta represents MCI, Textron, Universal, CBS, the Recording Industry Association of America, the National Association of Broadcasters, and The Washington Post. Meanwhile, over at the White House, where John Podesta now toils as Clinton's chief of staff, Tony Podesta is a familiar face and informal mately prevail. "The Valley guys generally start out with the view that politics doesn't have any meaning, and that politicians are bumper stickers traveling as human beings," he says with a shrug, as if to indicate the suicidal futility of such a stance. "They don't understand it's in their interest to pay attention."

"It's a Mars-and-Venus kind of thing," agrees Michael Maibach, who's spent most of the last 15 years as Intel's government affairs point man in Washington. Unlike Podesta, though, Maibach largely blames the "machine age" federal bureaucracy for the culture clash. "The Commerce Department takes 20 months for a patent review," he grouses. "That's two months longer than our product cycle."

But when the Clinton administration launched antitrust actions against Microsoft and then Intel – a spectacle that alternately cheered competitors and aroused fears of more wide-ranging government oversight – Silicon Valley's bluster began to sound

### "It all comes down to a **bandwidth issue**," says Podesta. "How much time can **your company** afford to **not spend** on politics?"

policy adviser, and has shepherded several tricky nominations through Congress. "We've got a hundred, maybe 200 people at the most in Washington who really get science and technology," says Jeff Smith, executive director of the White House Office of Science and Technology Policy. "Tony's right up there. He exercises a very influential role in tech policy now."

"I'm not so much of a tech guy," Podesta demurs. "What I really am is a translator."

Politicians and information-age gurus alike love overblown rhetoric, and it has become commonplace to pose the current battles over tech policy as nothing less than a war between paradigms: Will Silicon Valley and its speeded-up New Economy change the way business is done inside the Beltway, or will Washington tame the geeks? For the record, Podesta is betting that Washington, built on an enduring and nuanced obsession with power of every kind, will ulti-

hollow. "In some ways," says Maibach ruefully, "it was a blessing to be ignored."

Then came the pivotal moment: the billionaire geek who couldn't believe that guys who failed high school physics were judging his software getting slapped down hard by politicians who couldn't believe that a guy who didn't grasp high school civics was giving them back talk. "All of a sudden, people began to get interested in what the government could do," Podesta observes. "It happens when you get a sock in the teeth."

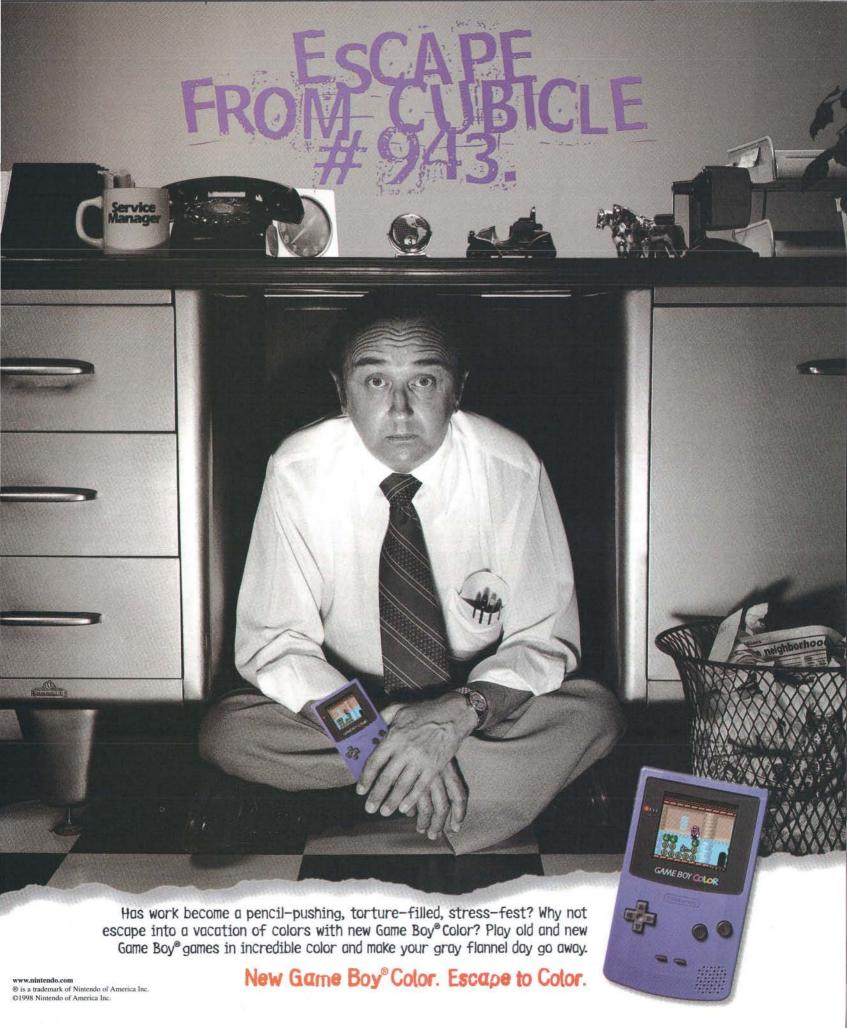
The high tech industry is, of course, far too heterogeneous and volatile to have anything like a single agenda in Washington, or even to agree on what its interests are. But that same industry is realizing that its isolationist days are over. This year, Microsoft alone had 56 lobbyists working inside the Beltway. (Podesta, favoring the long view of human events, is staying out of the Microsoft wars, at least for now.

"We have friends on both sides," he says, delicately.) During 1996, computer industries spent \$19.9 million on DC representation, a number that jumped nearly 30 percent, to \$25.4 million, last year.

Political contributions increased, too: In the 1996 elections, federal candidates and their parties got \$7.3 million in PAC, soft money, and individual contributions from traditionally tightfisted tech companies. While that hardly matched the amount forked over by more seasoned industries – Hollywood, for example, gave more than twice as much – the potential was obvious to politicians. The political allegiance of high tech, the fastest-growing sector of the economy, was up for grabs.

In this climate, Podesta has become not just a lobbyist but a power broker, with both parties bidding for his clients. Veteran high tech lobbyist Kenneth Kay is frank: "Our guys," he says of the companies he represents, "are probably basically Republicans, but they had a president who only cared about oil and gas. Now they've got a Democrat who understands them, and the GOP has to catch up." Democrats are leaving behind the machines and philosophies that grew out of the industrial economy, while Republicans are seeking to broaden their reach beyond the established business community. Ambitious politicians are rushing to brand themselves with the Silicon Valley seal of approval, flying out to Sunnyvale meet-and-greets in search of techies who'll help them cash in on the industry's image of wealth and youth. Even pending impeachment hearings didn't keep Bill Clinton from a late-September fund-raising dinner with the Silicon Valley élite hosted by Kleiner Perkins partner John Doerr.

But there's much more to the DC operating system than the basic GOP-versus-Dems diagram. The translation skills of go-betweens are essential if geeks are to master the political nuances of Beltway squabbles surrounding issues like ecommerce and Internet telephony. In just one example, while White House ecommerce guru Ira Magaziner recently pledged the administration's commitment to keeping the Internet tax-free and basically unregulated, the nation's governors of both parties (as well as members of Congress who speak for the interests of highly regulated broadcast



and telecommunications industries) are loath frontier Foundation in his living room, and to favor the newcomers with a free ride. characteristically remained friendly with all

"It all comes down to a bandwidth issue," says Podesta, pointing to looming regulatory decisions on encryption, immigration, WIPO legislation, and obscure but vital tax and securities legislation. "How much time can your company afford to *not* spend on politics?"

podesta is a gregarious man, quick to show his old-fashioned manners, his raspy laugh, and his temper. Tan and barrel-chested, with finely carved Italian features, he stands out amid the herds of lawyers trotting dutifully through the city's corridors. "Tony's big," explains Elizabeth Inadomi, a lawyer and encryption expert at Podesta Associates. "He's large in terms of size and – well, just large. Flamboyant. This is a town where everyone wears navy, navy, navy, and maybe charcoal gray. Tony has been known to wear aubergine. And that's just the suit."

An inveterate host and passionate art collector, Podesta likes to keep his friends up late, cooking for a constant stream of DC insiders who savor political gossip and homemade pesto in equal measure at his spacious Woodley Park home. His social circle spans party affiliations and the public/private sector divide, bringing together ambassadors and corporate execs, speechwriters and senators, pollsters and newly

Frontier Foundation in his living room, and characteristically remained friendly with all the founders after a bitter split – their conversation is more likely to center on politics than technology. "I studied at MIT," Podesta explains, "but, uh, I didn't bother to take computer science."

He did, however, pick up enough by the late 1980s to realize that seemingly unbridgeable cultural differences were blocking a potential alliance between Washington and Silicon Valley. "For a lot of politicians, high tech is basically just a photo-op," he says. "You talk to some senator about portals, he thinks that's what's in front of the Navy building. But then you tell some Valley guy, 'We're gonna meet with the head of the Office of Information and Regulation Affairs at the Office of Management and Budget,' and he thinks, 'Oh, nobody important.'"

Knowing who's important and what everyone needs is the working motif of Tony Podesta's life. He grew up in Chicago, the eldest child of a first-generation Italian immigrant and a small, smart, stubborn woman from Greece who is still traveling the world at 80 and dispensing advice to her powerful sons. He cut his teeth in student government at the University of Illinois in Chicago with his friend (now US Senator) Carol Moseley-Braun; organized presidential races for an impressive string of Democratic losers, including Eugene McCarthy,

can Way. But with an apparent eye toward life after partisan politics, he managed to retain Republican as well as Democratic friends in Congress – a painstaking campaign he refers to simply as "expanding my circle of allies." Hilary Rosen, director of the powerful Recording Industry Association of America, has watched Podesta at work for a decade. "Tony manages his conflicts of interest well," she comments. "He understands there's going to be a tomorrow for everyone. The long run matters."

Podesta also understands the symbolic importance of well-timed and even-handed giving. Not only does he cook for all, Podesta ranked 19th out of the 100 top-spending lobbyists in individual political donations in 1996, and says he "maxed out" his permissible federal contributions for 1998 by August. And he urges his clients to join in. "I tell people it's better to be in the game than not to be," he says. "Nobody ever got hurt in Washington from knowing too many people."

h, sure, I'll hold, no problem," Karen Lewis is saying, as she hyperventilates into her headset. Tony Podesta's frizzyhaired, superstressed assistant searches through a pile of papers and takes another sip of her Mountain Dew. "Tony's on his way," she says sweetly to the next caller, standing up and looking under the pile beside her chair. "Can Dick tell us if we need to reschedule the conference call? OK, I'll hold." Lewis pulls off the headset and sighs theatrically. "I am going to have a nervous breakdown." Another call. "Yes, Tony got NAB to contribute to the event, and he's working on other people. We'll get back to you."

The downtown DC offices of Podesta Associates, with a dozen principals and 10 associates, are about as mellow as those of the typical start-up – albeit with wilder art. In Podesta's own office, phallic black and white swirls by a young Israeli artist erupt next to an ecstatic mural-sized piece by Brazilian painter Beatriz Milhazes; Artforum and dealers' catalogues are piled next to Roll Call and Rolling Stone on a twisted aluminum sculpture that serves as his coffee table. The phone rings again. "He's walking in now," says Lewis. "Can you hold?"

Podesta has just returned from a business

### "Tony's big," says an associate. "Large. Flamboyant.

In a town where everyone's **navy**, **navy**, **navy**, he wears **aubergine**. And that's just the suit."

subpoenaed White House wonks. He's wired into the enormous and expanding network of telecommunications heavies who revolve through positions at the FCC, telecom corporations, and lobbying firms. He doesn't hang out much with the Valley's big boys on their own turf, preferring to host the occasional dinner "with real food" when a Tech-Net delegation comes to town. And though Podesta still sees people like John Perry Barlow, Jerry Berman, and Esther Dyson – he midwifed the birth of the Electronic

George McGovern, and Michael Dukakis; and did time on the Hill as a consultant and staffer. As counsel to Ted Kennedy, Podesta was a driving force behind the Massachusetts senator's bitterly fought campaign to derail the Supreme Court nomination of Robert Bork in 1987, an episode that is widely remembered as having launched the era of relentlessly personal attacks in Washington. Podesta went on to become the founding president of Norman Lear's fight-the-Right group People for the Ameri-

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trip to Romania on behalf of Textron to see about a helicopter deal, and a quick jaunt to Paris to watch the French Open. The night before, a packet of ripe and reeking Livarot stashed in his briefcase, Podesta had crossed five time zones, cooked dinner for eight – featuring the French cheese, along with a fine Ligurian pesto – made a few dozen phone calls, yelled at some staff, and answered his email before waking at six to start the day's round of meetings. Wrestling off his jacket, Podesta goes to work without ceremony, skimming through his long and detailed phone list. He stops somewhere in the "C" pages, between CBS, CIA, Commerce

John, saying, "At this point, we have more Republicans than Democrats in the firm." But as he told a reporter when his brother was appointed to the White House as Clinton's staff secretary, "I would be disingenuous to say it hurts me."

"Politics is a business," he says later on, "and you want to understand who's in charge. But there are potential allies everywhere, if you understand that you're in it for the long haul. I have my own political views, but that doesn't mean I can't work with everyone."

Such pragmatism poses problems for true believers like Grover Norquist, the

### "Hi, Tony Podesta – **what can I do for you?**Let's get together and **gossip**, I'll cook you **dinner**. Call me."

Department, and Corcoran Museum of Art. He picks up the phone, turns on his heartiest voice, and starts to pace the room. "Hi, Tony Podesta from Chicago, 39th Ward, regular Democratic organization, what can I do for you?" he booms. There's a pause, then he cackles. "Let's get together and gossip, I'll cook you dinner. Call me."

Like so many of his clients, Podesta is working an information economy. "Tony's a router," says the White House's Jeff Smith. "He knows how to get people from A to B." Or, as Podesta puts it, "I'm software. I'm a server, I'm a switch, I'm all of the above."

But whatever the metaphor, it's all about the strength of your network. For lobbyists, "Do you know him?" is the ubiquitous question that determines the outcome of every deal, and with Podesta, the answer is likely to be yes. "If you're looking for someone who can call Trent Lott at home," he tells a potential client at one point, "there's people better at that than we are." But then he drops into the conversation the fact that a Podesta Associates principal named Kimberley Fritts happens to be the daughter of the head of the National Association of Broadcasters (a Podesta client) and a former staffer for Republican senator Connie Mack of Florida. Podesta is apt to downplay his impressive connections through his brother

conservative who founded Americans for Tax Reform and is perhaps the most important secular power broker of the grassroots Right. Norquist, a lobbyist for Microsoft, tries to deploy his considerable business savvy in the service of an anti-Clinton, antigovernment strategy, and finds it difficult to simply sidestep ideology. "Tony Podesta's a serious lobbyist," he says grudgingly. "But he labors under the problem of being a Democrat. At the end of the day he won't be able to solve your problem."

ecency," Tony Podesta was saying, "dictates that we talk about politics tonight." It was a breezy September evening, and he had just kissed Carol Moseley-Braun goodbye at the door of an upscale Italian restaurant in downtown Washington, crossed the room shaking hands and greeting power diners, and sat down with a sigh. A few blocks away, in the Capitol, independent counsel Kenneth Starr's 36 boxes of documents were stacked under guard, emitting vibrations strong enough to disturb the atmosphere at every table in Washington. Podesta ordered a bottle of Amarone and leaned toward his guest, John Williams, the CEO of Biztravel.com. "I'm afraid your testimony at the Aviation Subcommittee just might not get a lot of press tomorrow," he said dryly.

The Podesta brothers, who ran Podesta Associates together for 7 years, had pulled even closer than usual as the Clinton sex scandal built. Both were Clinton loyalists: Tony had run the Clinton-Gore campaign in Pennsylvania in 1996, and John, dubbed "the Secretary of Shit" by colleagues during Whitewater for his damage-control role, had fiercely defended the president as each new allegation surfaced. When John was summoned to testify before the grand jury investigating the Monica Lewinsky affair, "Uncle Tony" had spirited John's children off to Italy with their grandmother. Now Tony was calmly going about his business with clients, congressional representatives, and Democratic Party bigwigs, while his brother coordinated staff response to the scandal, and the mood inside the White House lurched from anxiety to hysteria. "I don't know much, of course," Tony said, sounding unworried, when people asked him how John was doing, or what Clinton's inner circle thought. "I haven't wanted to ask." But Tony was showing up at the White House on Saturdays and evenings to help his brother with strategy, and he clearly relished being back in the thick of urgent, real-time politics. Now he smiled gamely and raised his glass. "Cheers," he said. "To the republic. God help us."

Knowing how Podesta could spin for the Clinton White House at the height of its crisis makes it fairly easy to imagine him successfully executing corporate PR on the Hill. Indeed, Anne Schelle of Telos Technologies, who consults for a new coalition of PCS companies, says Podesta "has a gift, almost like successful selling," when he represents his clients.

Making the circuit with Podesta, you can see how the game operates – and occasionally doesn't – on behalf of technology companies. Case in point: Genentech. The biotech giant was Podesta Associates' first client a decade ago, when Podesta's lobbying style tended toward the splashy, mediadirected side of the game. (When the California Poultry Industry Federation asked him to fight legislation that allowed its competitors' frozen chickens to be labeled "fresh," Podesta carried a crate of the icy birds to Congress and set up a bowling tournament with them in the halls.) His work for Genentech began conventionally



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enough, as he guided the company through hearings on human growth hormone or numbingly dull negotiations about R&D tax credits. But it was Podesta's more out-of-the-box tactics that paid off for Genentech in 1997, after nearly three years of dogged lobbying for a pharmaceutical coalition, when he won sweeping changes in the operations of the Food and Drug Administration. "The opportunity to do this kind of stuff comes along once in a generation," says Walter Moore, Genentech's vice president for government affairs. "And Tony provided the bipartisan glue that made FDA reform happen."

"Reform" of the FDA had been on Genentech's agenda from the beginning of the first Clinton administration. The company felt crippled by the agency's arduous drug testing and approval process, its labeling and advertising regulations, and its restrictions on the experimental uses of approved medicines. Podesta knew that Genentech could not get new legislation written through traditional insider negotiating alone, so he launched a brash public-relations campaign that took the fight into the open. "The FDA was well thought of," he says. "We didn't

regulations and get their innovative products to market as quickly as possible. Meanwhile, the AIDS epidemic had brought a new force into the equation: educated, articulate, desperate patients who had learned how to work the regulatory system, taught themselves advanced pharmacology, chained themselves to the railings outside FDA meetings, and harassed the pharmaceutical companies over pricing and access to medicines.

Podesta saw an opportunity for Genentech "to convert what could have been seen as a deregulation scheme into a matter of patients' rights." And, in an early meeting with Senate staffers, he says, he decided to add the issue of wealth to the issue of health: "I argued that either we were going to streamline the US government, or the most advanced health technology companies in the world were going to move all their jobs to Europe."

He seized on the 1996 congressional campaigns to launch Genentech's push for legislation to overhaul the FDA.

"The fact that people are running and want to visit with constituents usually makes their attention span go up," Podesta were consumer activists worried about inadequate drug testing, doctors appalled by corporate carelessness, old-guard pharmaceutical companies, and FDA bureaucrats invested in the status quo.

Back in Washington, Podesta identified "three zones of power and authority" in addition to the Congress members writing the legislation: the FDA, the Department of Health and Human Services, and the White House. Genentech's Moore recalls watching as the pieces were assembled. "Tony was able to keep the consensus together all the way through," he says, "when every word in the bill was contentious. He knew Barbara Boxer and got her on the same page as the head of the labor committee. He knew Greg Simon [then the vice president's chief domestic policy adviser] and Sally Katzen [then at the Office of Management and Budget], who were working on it from the White House. His contacts were everywhere."

Greg Simon recalls "hundreds" of private conversations and "endless" meetings on the subject. "Tony was one of maybe two people I ever looked forward to hearing from," he says. "I could actually trust him to tell me not only his client's point of view, but what was going on politically." What was going on politically, of course, had been largely stirred up by Podesta Associates' "grassroots" PR blitz, as well as by Podesta's own behind-the-scenes network of friends. "I was the point person for the administration on this," says Podesta. "They'd sit down with the pharmaceutical association, the biotech association, the medical-devices association, and David [Beier, then Genentech's vice president for government affairs]. Genentech was always at the meetings, because I was the one who organized the meetings for the White House."

The deal was finally closed, says Podesta, at an after-hours White House meeting, after he negotiated a final round of compromises concerning the off-label uses of approved drugs. "We gave up on some restrictions, Senator Mack agreed to narrow his original statute, and the FDA gave up trying to restrict information to doctors. Overall, in terms of the scope of what could be made available and how, we won, but everyone got something they wanted."

### With the White House in **crisis mode**, Podesta found himself back in the thick of **real-time** politics. "Cheers," he toasted. "To the republic. **God help us**."

need to bash [then FDA head David] Kessler. notes. "Instead of simply testifying in hear-we just needed to be more energetic and compelling with our message than the agency was." notes. "Instead of simply testifying in hearings and meeting with staff in Washington, we took it to key players in their own back-yards. We got patient groups organized,

And biotech's message was loud and clear: deregulate. By the mid-'90s, a rift had opened between older pharmaceutical companies – large, diversified, heavily invested in infrastructure – and the newer, more audacious start-ups churning out not just new drugs but new processes for making drugs. The older companies, fed by a steady stream of profits from existing "classic" drugs and thus able to devote years and years to research, wanted a strong FDA to help them keep tight control of their patent. The younger companies, surviving on venture capital, needed to slash through

notes. "Instead of simply testifying in hearings and meeting with staff in Washington, we took it to key players in their own backyards. We got patient groups organized, we got employees of medical-devices companies to meet with candidates on their home turf, we basically ran a grassroots political campaign."

The battle took shape: On Genentech's side were desperate patients, doctors looking for new treatment options, and other biotech start-ups with products to sell. They gathered support from White House economists friendly to high tech, and from Vice President Gore, who saw political opportunity in getting drugs to sick people under the rubric of his "reinventing government" platform. On the other side

Despite the months of highly complex negotiations, Podesta describes his strategy in simple terms. "First, you have to make the technical issues into issues people care about, and have voters bring them home to politicians. And then you have to be in the conversation enough so that you know who everyone is and what everyone wants." He pauses, and then repeats his essential mantra: "You know why I'm good at what I do? I know what everyone needs."

In early 1998, the White House chose Genentech as the site for its announcement of an extension of R&D tax credits. "We held that event at Genentech to thank Gore for supporting us," says Podesta. Gore enthused to the press about healthy MacArthurs I saw it in the paper," Podesta muses, with an odd, abstracted melancholy. "There was a time when I would have read the list to see who won it for politics, and now I just don't care. I only care about the artists."

The telephone seems to revive him. A constant stream of calls is rolling in, and he needs to make one quick call to clear up some details from his trip to Romania before his final meeting. "It's a \$33 billion economy and a \$2 billion deal," Podesta says in a reasonable tone. He starts to pace, gesturing with a free hand. "What I was told is that he's running around trying to undo it. But if we don't end up with the 90 attack helicopters nothing else is possible." He lis-

### Forget speed and profit, says Podesta: "Democracy is messy and slow." Which plays to his ultimate strength: "I know what everyone needs."

families and a better future just weeks before news of breakthrough breast cancer drugs pushed up both Genentech's and the vice president's stock. Not long after, a new chief domestic policy adviser to the vice president was appointed: David Beier of Genentech.

odesta says he never made an overt decision to forgo running for office himself. "I was just always more comfortable in the background," he admits. But he still feels the need to defend the choices that have led him from hardcore liberal crusader to big-business mouthpiece. "I haven't really changed," he insists. "I still believe in social issues like abortion rights and the First Amendment, stopping censorship. I guess I'm maybe a little more economically conservative now, more fiscally responsible. I'm a little more libertarian in terms of what I think government can do."

Like many Democrats of his generation, most notably Bill Clinton, Podesta's pragmatism seems to have supplanted an earlier, passionate ideology. And like a lot of Democrats who worked for Clinton, Podesta may lately be experiencing Beltway burnout. "You know, when they announced the

tens for a moment, still walking. "Who do they need encouragement from?"

"The ambassador wants to bring some Romanian software guys to Silicon Valley," Podesta says after hanging up. "It's just a favor, but I'm going to see if anyone's interested. I'll call Jerry Yang." He gazes at a painting on his wall. "Yeah," he says, "they're visionaries out there in Silicon Valley. But nobody's gonna invent three branches of government and bicameralism.

"Business has the idea that the public sector should be driven by speed and profit," he says. "But democracy is messy, democracy is slow." Podesta shrugs, as if he's recited the same lesson hundreds of times to visitors from Silicon Valley. "High tech guys just have to learn to live with it," he says. "There are smart people here, and there's a way smart people can do business." He reaches for his briefcase.

"We have no permanent allies," Podesta adds. "We have no permanent enemies. We just have interests."

And he's out the door, fast. . .

Sara Miles (smiles@igc.org) is writing a book about the technology industry's impact on the Democratic Party.

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### the big tease

### By André LaPlume

here's a fascinating bit of geographic revisionism taking place in Manhattan: Seventh Avenue now intersects with Lower Broadway. That's right – the fashion industry is making its way down to Silicon Alley.

The results may be beautiful, but they ain't pretty. Yahoo! sponsored a fashion event at Gramercy Tavern in the fall. The connection between powwow and patron wasn't immediately obvious. I think it had to do with Yahoo! pushing advertising sales, the presumption of which has given the directory service a market cap bigger than Pennzoil's. But online advertising is yesterday's revenue stream and ecommerce is tomorrow's revenue stream (at least that was the maxim back in September-October), so the

party may have had to do with selling fashion online. This is a deranged concept, given that most people surf the Web to look at women who aren't wearing clothes.

A friend of mine who is an analyst was at the Yahoo! party. He turned to the guy next to him at lunch: "What do you do?"

"I work at Nicole Miller."

"Oh yeah," my friend answered, feigning recognition of the name. "What do you do there?"

Slightly annoyed: "I'm the CEO."

A few minutes later, supermodel Niki Taylor went from table to table chatting about online. To my friend, this was now an episode of coming-of-age proportions. Like most people

André LaPlume works at an interactive ad agency in Silicon Alley, a made-up thing. down here, his favorite pastime is watching E! Entertainment Television (a big reason, by the way, that CNET never made it as a TV network). So he's kind of gotten used to thinking about supermodels. Now, here was the most super of supermodels suddenly validating the coolness of our business! As he got up to give his presentation on the future of Internet commerce, he began to fantasize about Niki, conversing, dating, and merging.

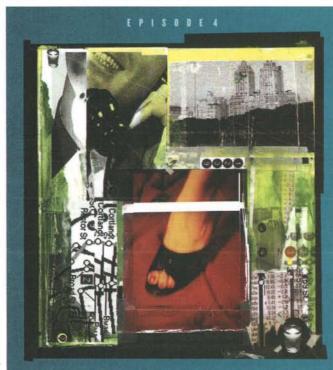
Two frames into his PowerPoint presentation, she left. He was crestfallen, but he shouldn't have been surprised. From my experience, models and modems just don't mix.

Consider the New York launch party for AOL 4.0, which took place a few weeks earlier. America Online had pulled out all the

stops for this one. Steve Case and Bob Pittman were in full pump-the-flesh mode. Donald Trump was there; so was some guy who had starred in the movie Gremlins; so was "hairdresser to the stars" Frédéric Fekkai. But topping them all was A-list model Bridget Hall.

Yet no one was paying attention to her – or to any of them, for that matter. Instead, the Alley digerati were swarming and fawning over a nondescript schlumpf named Tom Weber. Tom Weber is from Wall Street Journal Interactive. If the Journal's around, you can tell your models to go pound sand.

The point I'm trying to make here is that Silicon Alley, for all its postindustrial pretensions, is very much a '50s kind of place. Models and fashion shows? You are more likely to find the Alley's



For all its postindustrial pretensions, the Alley is a '50s kind of place. If the Journal's around, you can tell your supermodels to go pound sand.



denizens absorbed in the drama of neosecretarial dalliances and an upgraded version of the three-martini lunch.

The liquid lunch is a relic of the past, but not because people aren't drinking anymore. The real reason is that offices with doors have morphed into particleboard cubicles, so no one has a couch on which to take the postprandial nap. That's forced the tippling (and the workday) into the evening, where the postwork drinking festival now rules.

At many companies, the core group hits the street pretty much every weeknight. On one recent evening, a bunch of us were out at the M&R bar over on Elizabeth Street. A new guy (I think he works in MIS) was drinking like a madman. I suspect he's only recently out of college, because he was doing shots of Jägermeister.

I need to stop here for a second. This stuff just doesn't happen out in Silicon Valley. It can't. They are way too busy writing code and sleeping under their desks and driving. (Driving may be the biggest difference between Alley and Valley. There, everybody does it in a leased BMW;

here, we pay Gujarati immigrants \$2 for the first 1/10th of a mile to do it for us.) Cars aside, things are different here because Silicon Alley is about media and content, not about software and routers. They've got Amazon and Microsoft; we've got Prodigy and My-CD.com (both horribly unsuccessful and headed up at various times by SA gadabout Ed Bennett). So people have plenty of time to drink.

Anyway, there we are in the M&R, and the new guy, Sam, decides to buy shots. I put a few down and pour the rest into a flowerpot; I'm over 30, so I know my limits. After a while, the kid comes over, depressed. "I'm sorry," he says. I ignore him. "I'm sorry," he repeats. I give him one of those looks that says, "Beat it, kid."

A minute later, one of our media buyers, Rob, comes over. "I warned Sam that he better stop bothering you," he said.

This was a major coup. Without lifting a finger, I'd achieved curmudgeon status. My VP-level job and my all-knowing but actually empty scowl had combined to create the intimidating aura of an executive whom

others had better leave alone or else. And I was just standing there. This was very cool. This was also very '50s. The hierarchy of inebriation was perfectly intact.

Out-of-town conferences are yet another reminder that in my sector of the world not much has changed in the last 40 years. Alcohol has nothing on distance as a fuse to ignite that most retro of professional activities: cheap office sex. Mind you, we don't have secretaries; we have admins. And they're strictly off-limits, since they are direct subordinates and that's the quick road to lawsuits, which didn't exist in the '50s. So we're left with dashing, brilliant, and beautiful colleagues who don't report to us.

Last month, like so many Shriners minus the fezzes, our senior staff descended on San Francisco for a meeting. After the first full day of activities (most of which revolved around how advertising was yesterday's revenue stream and ecommerce is tomorrow's revenue stream), a large group headed up to the bar on the top floor of the Mark Hopkins. Tara, a brilliant creative director at the agency, was there. She and I had been playing games for three months, but nothing had happened.

I had managed to convince Tara we were in a rotating bar that would eventually provide a 360-degree view of San Francisco. That she believed me was a good indication of how much liquor she'd had. We had flirted before, but I had put her off – the don't-jeopardize-your-equity thing. But here, out of town, in a paroxysm of weakness, as all of us were filing out after last call, I impulsively blurted, "Call me when you get to your room."

Down in my room, my message light was blinking. It was from Erica, who was also at the conference. She is a very young sales assistant –

and one night she and I had gone out for drinks in Manhattan and she didn't want to take the train out to the Island, and now her message was simple: "Call me when you get in."

So here I was, priding myself on being an upper-echelon drunk. What can I say except that pride really does goeth before the fall? I called Erica and told her to come by for a drink. The rest was textbook. She showed up. Minutes later, Tara called. My pained silence led to the inevitable, "Is someone else there?"

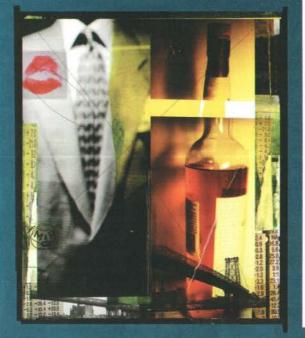
"Uhh. No." Not at all convincing.

"Can I come down?"

"Uhh. No." My new mantra.

"Why not?"

"Uhh. I don't know." Variation on a theme now.



Though the hierarchy of inebriation is perfectly intact, alcohol has nothing on distance as a fuse to ignite that most retro of professional activities: cheap office sex.

Tara hung up, exasperated.

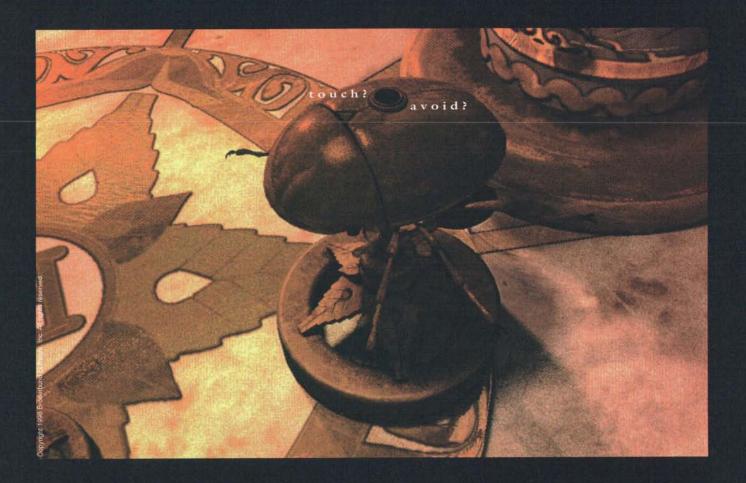
Erica: "Was that Tara?"

"Uhh. Yes." Not too suave.

"I'm leaving."

"Uhh."

See, that's why sex in the Alley is like the '50s: Just as in those old Doris Day-Rock Hudson movies, there is rarely, if ever, real sex. Instead, these potentially wealthy NM guys just sit around and drink and fantasize about making it. Niki Taylor and Bridget Hall aside, that's Silicon Alley's real business model.



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### erform a supreme act of imagination: Envision a world in which Microsoft doesn't dictate your personal computer reality. Too much for you? Stay with us – we're about to give you 83 reasons why Redmond is not invincible.

Microsoft seems like a fact of life. We know how the company took over the desktop. But how did it get to be standard equipment in our consciousness? Omnipresence helps. Windows and Office are everywhere. Then there's history: To paraphrase a Confederate general, the company may not have been firstest to the software battle, but it came with the mostest, and it humiliated a huge, established power, IBM, in the process. And, to keep the list brief, there's return: If something seems too good to be true, it probably is, unless you're talking about Microsoft stock; a \$1,000 investment in Bill Gates and company on the day they went public, March 13, 1986, had grown to \$258,000 by this fall.

But here's news: Microsoft is just a company, not a force of nature. It's not the biggest company in the world, nor the richest, nor even the biggest seller of packaged software (that's IBM). We reel at the mere thought, but Microsoft can be dislodged from its place at the center of the software universe. How?

Look at Microsoft today. It's beset by distributed-computing technology like Sun Microsystems' Java and Jini. It's threatened by the Internet, which is beyond domination by a single technology or set of tools. On dozens of fronts ranging from bandwidth to settop boxes to handheld devices to embedded systems, innovation is accelerating. No company can be boss of all the new stuff.

Yes, Gates is writing about The Era Ahead and talking about a new miniature computer and data storehouses and hooking MS Office users on an online software upgrade habit. Like any good horse player, the company is spreading its investment bets across the board: WebTV, cable TV, freemail, streaming media, and portal services, among many, many others. The company is trying to extend

Liates

its dominance into server software with Windows NT and to become the brains of the handheld universe with Windows CE. As for individual competitors, there's not a true dragon slayer in the crowd. Linux, a challenger in the server market, is still a geek's toy that no one in Redmond will really take seriously until they see developers lining up to write mass-market apps. Java and Jini are still mostly a dream (but one with enough substance that, a Sun lawsuit alleges, Microsoft has tried to take control of the language by promulgating a variant version).

So why worry if you're Microsoft?

Well, it's a baggage problem, and the Redmond Twenty-Seven Thousand are carrying a real load. For instance: the history of shipping buggy software and of taking their own sweet time to get things right; the habit of adopting hardball as modus operandi for all seasons and of assuming that they represent a superior kind of being; a forecast slowdown in the sky-high earnings that built the company's \$14 billion bank account; and, worst, the use of its PC desktop dominance as a works-every-time door opener to supremacy in new sectors.

For Microsoft, this dependence on dominance is a self-set trap. It has led the company to play rough not only with competitors, but with partners, too. It has given government antitrust prosecutors religion and emboldened legislators to consider whether the company's monopoly power has gone too far. It has given Sun, IBM, Apple, Novell, Oracle, and Netscape – as well as a new generation of competition – the resolve to continue to resist the corporate steamroller. Where do you want to go today? Microsoft asks. Some of the toughest voices in the high tech world answer, "To war."

**Funky Karma.** Ill will could be Microsoft's most widely distributed product. The company's strong-arm approach to business has provoked prosecutors, competitors, and would-be allies. The result? At October's Agenda Conference, for example, a non-wild-eyed audience of tech execs listened to



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Talk to Me, God! What will Bill bring back from his wanderings? Divinely inscribed tablets? A magic decoder ring? A new business plan? His strategic acuity has driven the company - witness his Saulon-the-road-to-Damascus enlightenment about the Net. Now that Gates has reserved the post of visionary, Microsoft's future in the fastest-moving industry in history rides on whether he's still up to the job.

Steve-a-reno. Eighteen years of history in the company aside, Ballmer as a company leader is an unknown quantity.

Joy's Law. "No matter who you are, most of the smartest people work for someone else." Even if your name is Microsoft.

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A market phenomenor

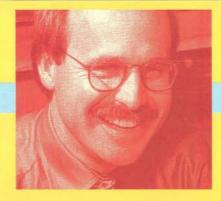
is born: The 11-year-old

company's IPO raises

\$61 million as MSFT

rises from \$21 to \$28

on opening day.



"Microsoft has never been an innovator it's a fast follower. And when you're as big and dominant as Microsoft. and growing at 30 or 40 percent a year, it gets harder and harder to find people to be fast followers of."

- Paul Saffo. Institute for the Future

D-I-V-O-R-C-E. For more than a decade, the Wintel duopoly has allowed mates Gates and Grove to control the PC industry's direction and pace. But now Intel, aroused by home wreckers (and competitive challenges) such as Java and Linux, sounds like it wants to move away from its happy partnership. As Tammy Wynette would sing it, a split would be "pure H-E-double-L" for Redmond.

The Un-Innovator. Legal posturing aside, Microsoft has hardly been a front-of-the-pack innovator. Instead, it excels at following, at seeing the importance of others' breakthroughs and capitalizing on them. Exhibits: Windows, a knockoff of Apple's knockoff of Xerox's desktop GUI, and Internet Explorer 3.0, a homely cousin of Netscape's Mozilla.

NT? No Thanks. Windows NT, the company's attempt to seize the lucrative network server market, is a bug-infested mess that, in its upcoming 5.0 version, could run to 35 million lines of code. Does it scale? Microsoft is still figuring that out - take a look at the endless snafus afflicting its attempt to switch its recently acquired Hotmail service to the homegrown platform. In a world of ever more varied, nimble, and ubiquitous computing, bloatware is dead.

The Unforgiven. To date, Microsoft has operated in a forgiving environment - the land of the PC desktop. There, bugginess is an annoyance, not a calamity. Its habit of shipping rough-cut software and letting users catch all the splinters won't fly when it's trying to sell NT and CE to customers that must have failure-proof reliability.

### The Rise and Rise of the Redmond **Empire**



4/2/87 MS OS/2 and Windows 2.0.

developer of PowerPoint.

7/30/87

Microsoft acquire Forethought, the

10/6/87 Microsoft announces its first Windows application: Excel

9/8/87 The company ships its first CD-ROM application, MS Bookshelf.

10/19/87 The Crash of '87: The Dow falls 508 points in a single session (MSFT falls 30.12 percent.)

9/21/87 MSFT stock (at \$114.50) splits two for one.

**APRIL 1988** Microsoft surpasses Lotus to become the Number One software vendor.

Apple files suit against

Microsoft, alleging

copyright infringer

in the Windows GUI.

REVENUE \$345:9 MILLION: 1,816 EMPLOYEES

1,153 EMPLOYEES MSFT stock price 3/31/86-10/20/98 (split-adjusted, month-to-month)

REVENUE \$197.5 MILLION:

- Internet Time. The Net poses a problem for even the quickest study and fleetest follower.

  Net players armed with big market caps like Yahoo!, Amazon.com, and America Online are moving so fast on so many different fronts that Microsoft will have a hard time choosing which to chase.
- Microsoft Time. Monopolists get used to taking their time. Consider NT 5.0. Anticipated this year, it has been delayed and delayed again. Judging from a GartnerGroup report, it won't be available until 2000 and probably won't be usable until 2001.
- Java. Slowly, relentlessly, it's coming. Performance issues dog it, speed first and foremost. But Windows and NT now indisputably face a platform that's drawing a big crowd of developers. And Java's underlying premise write once, run anywhere is a paradigm shift aimed straight at Microsoft's proprietary OS heart.
- Linux. This fast, stable, and free Unix-based OS is widely used (on 7 million mostly high-end desktops) and has won support from tech heavies including IBM, Oracle, Informix, and Intel. Still too geeky for prime time, Linux is nonetheless a threat to NT.
- One Big Computer. Sun's Jini. IBM's Pervasive Computing. Even Microsoft's Millennium project. All are looking beyond the necessity of operating systems to a radical new reality in which computing is universally distributed. Microsoft says, "We believe it is time to reexamine the operating system's role." We'll go them one better: Check on your business model.



"Even as Microsoft is relentlessly integrating more and more features into its software, the Internet is just as relentless breaking the delivery of code down into Java-style objects. Component software will do in Microsoft, just as surely as smaller hardware – the PC – brought down DEC and IBM."

– George Gilder, Gilder Technology Group

- Always Open. The movement toward opensource software is expanding. The world's most popular Web server software, Apache, is open sourced and free. IBM has announced it will support and install Apache for clients who want it. Open source lets developers and corporate IT managers customize software and build their own applications.
- Always Semi-Open. Redmond's response:
  "You'll see us start publishing more of the NT source
  code," Ballmer told developers in September."But can
  we provide our products for free? The answer is no."
- Razor-Sharp Freeware. Freeware doesn't need to take over Microsoft's \$7.6 billion-a-year platform market to inflict damage. If it creates enough competition that the company is forced to slash prices, Redmond's balance sheet goes up in flames.
- **Candy, Strangers, Et Cetera.** Make no mistake. When Netscape gives away Communicator and opens its source, it's trying to keep developers happy and sow its product. When Microsoft lets you have something for free Internet Explorer, say the tactic takes an ugly turn. It's usually a way of knifing a competitor, and the bill will come due later.
- Shrink-Wrap RIP. Notice any hot IPOs for companies making prepackaged software? How many brand-new desktop applications has Microsoft launched lately? Software development has moved down to the Net, where consumer and business apps often show up as freeware, or high-priced custom jobs for corporations.



Free's Still Cheaper. Bill says that Windows is a bargain — "less than 5 cents a day." (He's not counting the cost of psychotherapy for frustrated users.)

Note that gratis is even less than pennies a day, and that's what code costs on the Net. Would you want to have to sell against that?

Brand X Factor. You don't need Windows to use today's killer apps – Web surfing and email. In fact, the OS that happens to be running in the background is losing its importance for most computer users.

Best 9 Out of 17? Microsoft has won a couple of early sets in its antitrust match with Joel Klein. But it looks like the company is facing a foe determined to keep the game going until he finds a way to prevail: You won the first two? Fine, let's make it three out of five ....

Tora! Tora! Tora! The government lawyers aren't the only ones blasting Microsoft in court. Posing just as serious a threat are competitors and partners who are dropping legal bombs. The biggest of the bunch: Sun Microsystems' suit alleging Microsoft breached its Java license and is trying to hijack the language. Also on the docket: Caldera's Ray Noorda and his suit alleging illegal efforts to scuttle DR-DOS, and Bristol Technology's claim that Redmond has engaged in anticompetitive behavior by cutting the company off from the NT source code it needs to make developer tools.

**Chilled.** Whatever the outcome of the antitrust marathon, the suit has already forced



"Once you've locked in a huge user base - DOS. Windows, whatever you have to keep the technology backwardcompatible. That slows you down in terms of innovation, It's like Napoleon trying to take **Moscow: The further** you go, the longer your supply lines get. A fastmoving start-up with a new technology doesn't have to worry. For Microsoft the problem gets worse every day."

– W. Brian Arthur, Santa Fe Institute Microsoft to back off a key business tactic: the ever expanding web of licensing agreements and contracts that shoulder out competitors.

**Gunslinger.** Attorney David Boies put a big notch in his antitrust Colt by defending IBM against the Justice Department in the '70s. But he's wearing a badge now, serving as Justice's special trial counsel, and he's drawn a bead on Microsoft.

Emancipated Pixels. Gateway, Compaq, and other PC makers have used Microsoft's legal troubles to win a place for themselves on the sacrosanct Windows desktop. The immediate payoff is links to their company sites or to Microsoft portal foes like Yahoo! Longer term, this could thwart Redmond's ambition to shepherd Windows users through an all-Microsoft, all-the-time network experience.

Your Stigma Is Showing. Monopolies are at first praised for bringing order to markets and then blamed for eliminating choice. And once a monopolist, always a monopolist – unless you're broken up. However the trial goes, Microsoft will be on parole – at least in the public mind – for years.

Hearts and Minds. Polls suggest that though computer users like Bill Gates and his company well enough, they're not thrilled with it rolling into new territory. In a Time/CNN survey in May, half of the respondents thought Microsoft's dominant role in the software industry was a good thing. But half also said it would be a bad thing for the company to become dominant in providing Internet services.

Investment value 7/31/91 = \$15,750



3/1/92 Hallman steps down from the presidency and is replaced by a multimember "office of the president."

A Windows ad campaign is launched on TV.

6/15/92 MSFT stock (at \$112.50) splits three for two.



3/22/93 Microsoft Encarta ships.

1991 REVENUE \$1.843 BILLION;



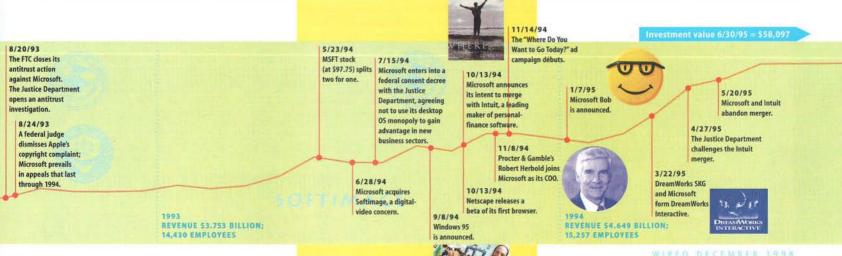
- a global media device. That puts Microsoft at the intersection of Big Money and Power Politics, where you make the signal turn green by figuring out which levers are pulled when. The Washington State crew has been slow to learn the Washington, DC, rules.
- Furorbunker. All Microsoft's market power aside, building World HQ near Seattle has not shifted Earth's axis or altered gravitational fields. The Evergreen State is still the sticks, and the company's physical isolation breeds technological and political problems. Redmond has acknowledged as much with its crash program to build an outpost in Silicon Valley.
- Hired Guns. Retired judge Robert Bork wrote the book on the evils of antitrust. Bob Dole thrived in Washington by learning how to be friends with big business. Heads turned when the two Bobs showed up earlier this year as front men for a DC-based anti-Microsoft lobby group, the Project to Promote Competition and Innovation in the Digital Age. With enemies like these, do you have any friends?
- Earnings Slope. Every year for 23 years, Microsoft has racked up record revenues and profits. But earnings are slowing from the 43 percent average rise between 1993 and 1997 to a forecast 23 percent or so over the next five years. Extra troubling: Earnings growth in the software sector overall is expected to rise from 19.6 percent over the last five years to 32 percent over the coming five. "Our expectations of the future can they be equal to past performance? No way," chief operating officer Bob Herbold said in July.



"Hubris is the death of all great companies. They think they can do no wrong. Or that they can always buy their way out. Where's the new horizontal market for Microsoft to dominate? The market is still expecting them to produce 40 percent growth. Well, you can't do that without creating – and then dominating – whole new markets."

– Vinod Khosla, Kleiner Perkins Caufield & Byers

- **Arithmetic 1A.** A \$14 billion company with 27,320 employees cannot keep growing revenue 40-plus percent a year the kind of performance that keeps investors drooling. Smaller competitors have an easier time producing magic numbers.
- Multiple Problems. Never mind Microsoft's \$249 billion market cap lower earnings could send MSFT tumbling. One sign the issue is vulnerable is its high P/E, the ratio of a stock's share price to a company's annual earnings. MSFT's multiple is very high compared to those recorded by traditional blue chips and other tech heavies. A P/E glance as of October: Ford, 9; GM, 15; Apple, 18; Hewlett-Packard, 19; AT&T, 20; IBM, 23; Sun, 26; Intel, 26; Microsoft, 62.
- stantly trying to lure smart new people to Redmond, and stock options have been good bait. But MSFT's sky-high stock price can be a turnoff. "Recruits have said, 'I don't think there's as much upside to Microsoft stock,' "chief financial officer Greg Maffei told analysts in July. "[They say] 'I want to go to a company that's smaller, that's not as highly valued, where there is more upside.'"
- **Postcool.** "At a certain point IBM wasn't the place to interview," says one source. "You get that sense about Microsoft now."
- **Pay Bomb.** Recruits aren't the only ones casting a cold eye on options. With the rise in the share price slowing, options lose their appeal for current employees, too. To keep its human assets



happy, Microsoft might have to shell out much bigger paychecks – an expense that will hit the bottom line hard. Said Herbold: "It's a big, big issue."

Too Rich to Innovate. In his "The Era Ahead" encyclical this September, Gates himself raised another side of the compensation conundrum: Motivating longtime employees who have grown wealthy, and perhaps complacent, on their Microsoft shares.

Trickle-Down Hubris. It starts at the top: the belief that you're smarter than the rest, that no one will ever quite get the world the way you do, that it's infuriating that anyone among the lower orders would presume to offer advice or direction. A corporate culture built on a belief in innate superiority is ripe for a fall.

Buyback Cul-de-Sac. With a \$14 billion bank account, Microsoft has the cash to prop up its shares. As many cash-rich companies do, it could go into a down market and buy back stock. But that's only a short-term fix: Buybacks don't grow the earnings that Wall Street craves.

Insiders and How They Trade. Bill G. sells a lot of stock from his 20 percent stake in the company (as of August, that was about 515 million shares). But is there a message to the increased volume of his trades? In August 1997, Gates sold 1.7 million MSFT shares; in August '98, 4.3 million. In the first eight months of '97, he moved 6.5 million shares; through the same span in '98, he had sold off 13.5 million.



"The performance of most Microsoft products way overshoots the needs of most of the market, which is the classic recipe for disruption by a cheaper, simpler technology. It has already happened twice in the computer industry – first with IBM and then DEC."

- Clayton Christensen, author, *The Innovator's Dilemma:* When New Technologies Cause Great Firms to Fail

- As the Index Turns. Microsoft is a big ingredient in the wildly popular index mutual funds; the billions poured into the funds have been one factor pushing MSFT ever higher and higher. But the Dismal Market of '98 scared a lot of investors out of the indexes. Microsoft could take it on the chin.
- The Wrong War. Microsoft has spent heavily to eke out the tiniest of leads in its browser war with Netscape. In the meantime, America Online, Yahoo!, and Excite have won a lot of eyeballs and dollars. Now Gates & Co. are spending hundreds of millions more to build their own full-service portal.
- IBM. But like the proverb says, what didn't kill Big Blue made it stronger. IBM is now trying to use its unmatched range, depth, and experience to thwart the Windows Everywhere crusade. Exhibit: Big Blue has committed big bucks to turning Sun's Java into the world's open computing platform.
- **Deep Doo II.** Never get on the wrong end of a holy war. Redmond rivals like Sun, Netscape, Oracle, and Novell have launched a jihad because they're convinced the software superpower wants to annihilate them. That belief inspires competition so fanatic that it's certain to do some damage to Microsoft.
- The Action Must Be Shared. Last year, according to The New York Times, CFO Maffei outlined Microsoft's business perimeter for a meeting of Valley venture capitalists. After hearing Maffei list everything the company considered to be potentially competitive



territory, the *Times* said, one VC partner turned to another and said: "I guess that leaves us washing machines and toasters." Listen up, Bill: New entrepreneurs want a piece of the action; competition will out.

- The Search for El Dorado. As Bill G. says, "The potential financial reward for building the 'next Windows' is so great that there will never be a shortage of new technologies seeking to challenge it."
- The Heart Thing. Caldera backer Ray Noorda on talking things out with competitor Microsoft: "To have a heart-to-heart, you need two hearts." Redmond, we've got a problem.
- Failure Virgins. Can the corporate culture in Redmond survive an IBM-style Waterloo?
- Planet of the Apes. Microsoft wants to be the 800-pound gorilla of cyberspace. The problem is that America Online, weighing in at 801, is already there. AOL, having weathered its own legal and PR troubles in the wake of the Flat-Rate Fiasco of '96, already has 13 million members and continues to grow rapidly. Memo: Bill, it's no fair to just buy it.
- Let's Make a Web Site! More time online means less time for special-purpose desktop apps. So Microsoft will spend more (so far, the Interactive Media Group has burned through a reported \$1 billion) on its fine family of sites: MSN.com, Hotmail, CarPoint, Expedia, and Investor, among others. Like any other new media player, all Microsoft has to do now is figure out how to make all that nifty stuff turn a profit.



"As Microsoft moves further and further from its core, it starts to run into competitors who are extremely good at what they do, know their domains a lot better than Microsoft, and are extremely proactive. Companies like Sun and IBM and Oracle don't just roll over and die."

– Michael Borrus, Berkeley Roundtable on the International Economy by Mac-only retailer ComputerWare found that 12 percent of new iMac purchasers were Windows defectors; 16 percent were first-time computer buyers. In a world of networked devices, style, superior interface, and ease of use are enough to make Apple a heavyweight again.

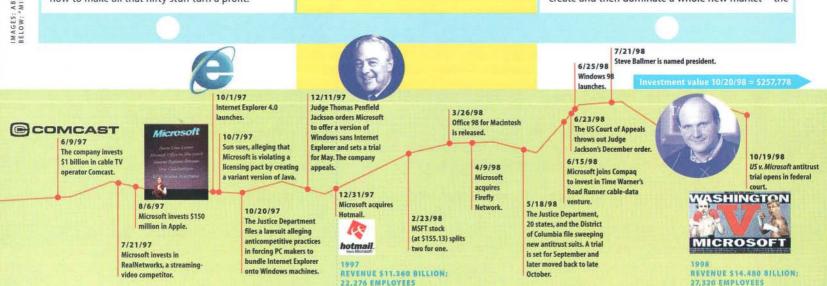
willyLoman.com. Ecommerce will be utterly ruthless and hugely expensive. Gates says, "It's going to be hypercompetitive." Although Microsoft will spend billions to play, it's not likely to find monopolystyle margins. Bill, meet Willy.

They Got Courage. Netscape, RealNetworks, Yahoo!, and the rest of the Internet rockets show that it is not suicidal to compete directly with Microsoft.

Thud and Blunder. MS spends \$100 million dollars a year on its unenchanting consumer advertising. The company has an uncanny ability to miss people on the emotional level: Its presence is big and heavy, like the Pentagon's. But massiveness doesn't make you feel good about paying \$700 for a toilet seat – or for paying full fare for overpriced software.

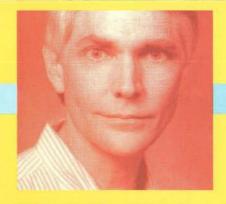
by It's Connectivity, Stupid. Quick – which would you rather have: Windows 98 running on the latest Pentium II PC or your tired old machine and a T1 line? Wintel is about leveraging processor speed. The future is about leveraging connectivity.

58 Saturated Fat. Increasing returns let you create and then dominate a whole new market – the



PC desktop, for example. But unless you can keep the paradigm shifts coming, returns shrivel as the market gets saturated. How many PCs do you want to own?

- MS TarPit. Now 20 years old, the PC desktop is a technological Jurassic Park. And Microsoft is trapped in it, fenced in by 182 million active Windows 95 users demanding backward compatibility.
- Nothing But Niches. Microsoft's omnipotence over users and desktops is an anomaly. Chips and bits have exploded in so many directions that there's no longer a single market to dominate. The corollary is ...
- Miches, Niches Everywhere. Microsoft must try to win the niches to keep adding the billions in revenue that Wall Street expects. But it will have trouble creating and mastering myriad new markets. Creating one market once was hard enough.
- its sales and licensing accounted for 40 percent of company revenue in fiscal 1998. But what's the growth potential? As CFO Maffei told analysts, "How many companies don't have a copy?"
- "Upgrading software is insanely profitable." But how do you get the rubes to keep buying? As updated software delivers less and less good (and needed) new stuff, it gets harder to sell. Microsoft's answer: pile on the features until you get something that looks like a '57 Cadillac hey, check out the fins!
- fully loaded OS browser, Java, channels, groupware, messaging, you name it. You've also got an unwieldy, unmanageable product that might collapse of its own weight. "The PC has continued to accrete complexity faster than people can absorb it," admits Craig Mundie, senior VP of Microsoft's consumer platforms division. "The problem is, there's no IT manager for the home."
- reluctant upgraders is to just raise prices and worry about the consequences later. One example: Companies must now license two "seats" for employees who use Office software both at work and at home.



"When you're the first one out there and you're ubiquitous — especially in an industry that involves networks — people inevitably will start talking about antitrust. The first and biggest company is the one in the bull's-eye."

– Peter Huber, Manhattan Institute



"Like any dictatorship, when things start to get tough Microsoft is going to discover that it has lots of allies, but very few friends."

- Dan Gillmor, technology columnist, San Jose Mercury News

- off Squeeze Two. Microsoft's answer to its bête noire, the network computer, is to migrate corporate users to NT and sell them thin-client software. But to avoid a decline in revenue, a source says, Microsoft will probably charge as much for a thin-client seat as for a full NT license. Linux, anyone?
- complex. The stress of maintaining the complexity of Windows and NT threatens to overwhelm Microsoft's ability to incorporate the Next Big Thing. Dynamically assembled, specialized software components that publish their interfaces and adapt to the environment in which they find themselves are a good bet for the Next Big Things. But that can't be incorporated into the Windows OSes without crushing them.
- Billions Not Yet Served. Most Earthlings have yet to buy a PC and probably never will. But they will buy plenty of smart electronic computing stuff. Who will supply it? Why would anyone bet on a company that has taken 14 years to reproduce the usability levels of the 1984 Macintosh?
- Software Devil, Go Home. Does anybody seriously think that any of the world's huge developing markets will cheerfully ship billions of dollars to an American company forever? With its potential market leverage, China, especially, might be able to give Microsoft a taste of its own medicine: Play by our rules or get lost.
- Cheap PCs. In 1997, 21 percent of consumer PCs sold in the US cost less than \$1,000. By the end of this year, the figure is expected to hit 31 percent. Great for you, bad for Bill. Low-end PCs ship with fewer and cheaper applications, and low-end buyers don't upgrade much or buy a lot of "after-market" software. With PC prices still plunging, Microsoft's profits fall, too.
- UnPGs. The 21st century's most common PC will not be a desktop box. It will be a handheld, something like the PalmPilot or digital books. It's a market that's up for grabs, and Microsoft's bid for the small-device OS, Windows CE, is struggling just to get a foot in the market door.
- Wireless? Clueless. Another crucial unPC battleground is the fusion of telecom and 254 ▶

### **Why Bill Gates Quit His Job**

Handing the presidency to Steve Ballmer was a pivotal concession: The company's product line is in trouble.

profound moment in Microsoft history passed last July with barely a media tremor: Bill Gates's de facto retirement from the company's day-to-day business and the formal elevation of Steve Ballmer to that operational role. The move, dismissed in most quarters as a no-brainer, was a clear acknowledgement of the problems Microsoft faces.

"This is a fundamental change in the company. It is more significant than anybody quite realizes," says Rob Enderle, a longtime Microsoft watcher with the Giga Information Group."It was extremely timely. Microsoft is facing its greatest set of challenges since the mid-1980s, when Novell was actually a threat, and IBM was looking like they would become one."

Why did Gates relinquish control? The official story: Last Christmas, Gates looked at his calendar for 1998 and saw that he was so involved in the nuts and bolts of running the company that he would be spending less than half his time on product development. And that simply wasn't acceptable. The unofficial take from inside and outside the company is more blunt: Not enough attention was being paid to product quality, and Gates was better equipped than anyone else to fix that.

Even though customers have long complained about Microsoft's products, analysts say customer satisfaction has never been as low. Some software, such as a recent service patch for Microsoft Office that was later called back, should never have made it off campus. Microsoft watcher Chris Le Tocq of Dataquest, putting it gently, says, "The hands had been off the wheel a little."

"He's going to drive the product managers nuts," says analyst Enderle. "But Bill can get programmers to agree to make changes that no one else can." In addition to working on product



development, Gates has told people within the company that he'll spend more time on long-range planning. The first concrete sign of this new focus emerged in September, when he produced a 10,000-word memo, "The Era Ahead," that, among other things, laid out plans for creating a system under which Net users could seamlessly and continually update their Microsoft wares, for making the company's Office suite a Web front end, and for getting into the business of becoming a central repository for user data through

a new generation of "megaservers."

Redmondologists see Ballmer's role as critical, too, for making customers happy. He brings to his new job the experience of having led the sales staff. Says Le Tocq: "Steve will bring customer focus deep into the company." For instance, technical product managers will spend time with customers in the field - the classic sales approach.

"To some extent, there has been a failure on the part of Microsoft in responding to enterprise computing [the corporate market for which Windows NT

was developed] with just technology," says Eric Brown of Forrester Research. Ballmer's promotion "represents a fundamental shift away from workgroup computing into not only enterprise computing but Internet computing, which requires a different sensitivity."

It will be a big part of Ballmer's job to make sure that Microsoft anticipates rapidly evolving technology. That, perhaps more than anything else including the ongoing federal and state antitrust action and a spotty product track record - is the greatest threat facing Microsoft. The Internetprovoked shift to a new computing model, with centralized servers and applications run off the Web, could eclipse its Windows franchise. Despite Ballmer's reputation as a fulminator, some credit him with a style more likely to keep the company on track than Gates's "everything-I-know-isright" approach to strategy.

"At a time when there is this fundamental shift in technology taking place, Bill was the ideal manager to take Microsoft down the toilet," says an industry analyst who prefers to remain anonymous when disparaging the company. "Steve, on the other hand, is much more willing to see what the situation is before making a decision."

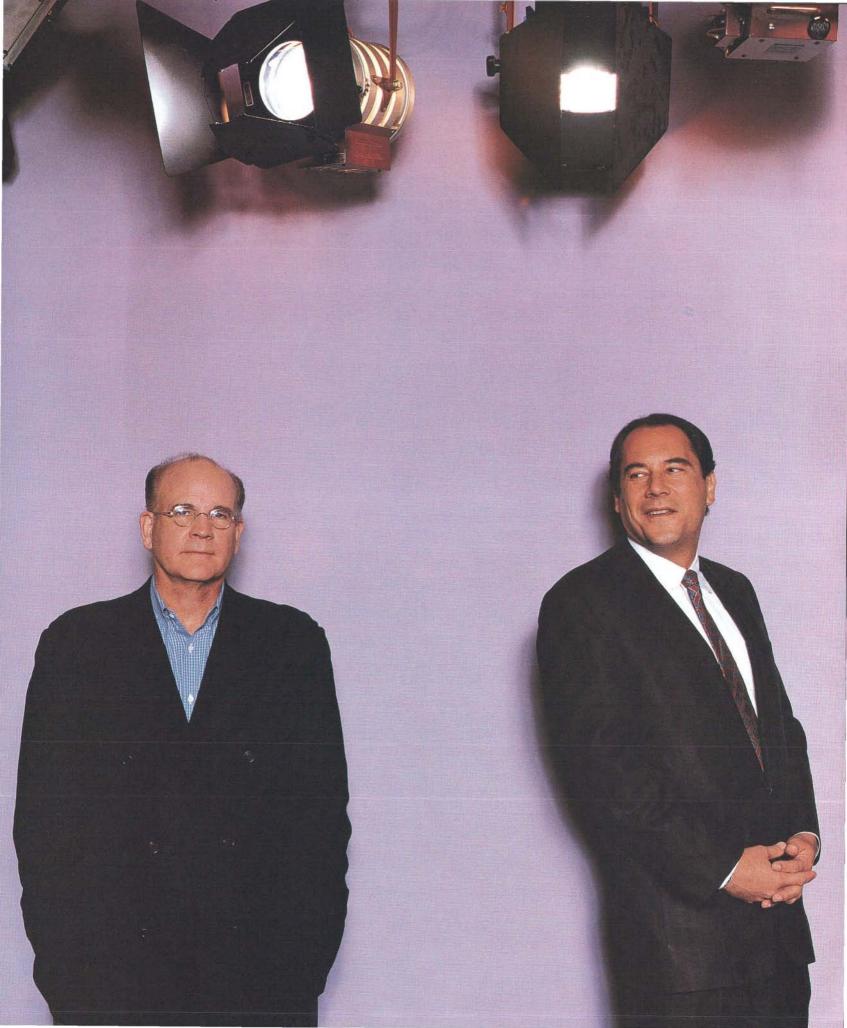
Both "roles ahead" - Ballmer's and Gates's - are tailored to the pressures of the moment. Ballmer has to repair a souring relationship with customers; Gates must better vet the products on which those ties are built.

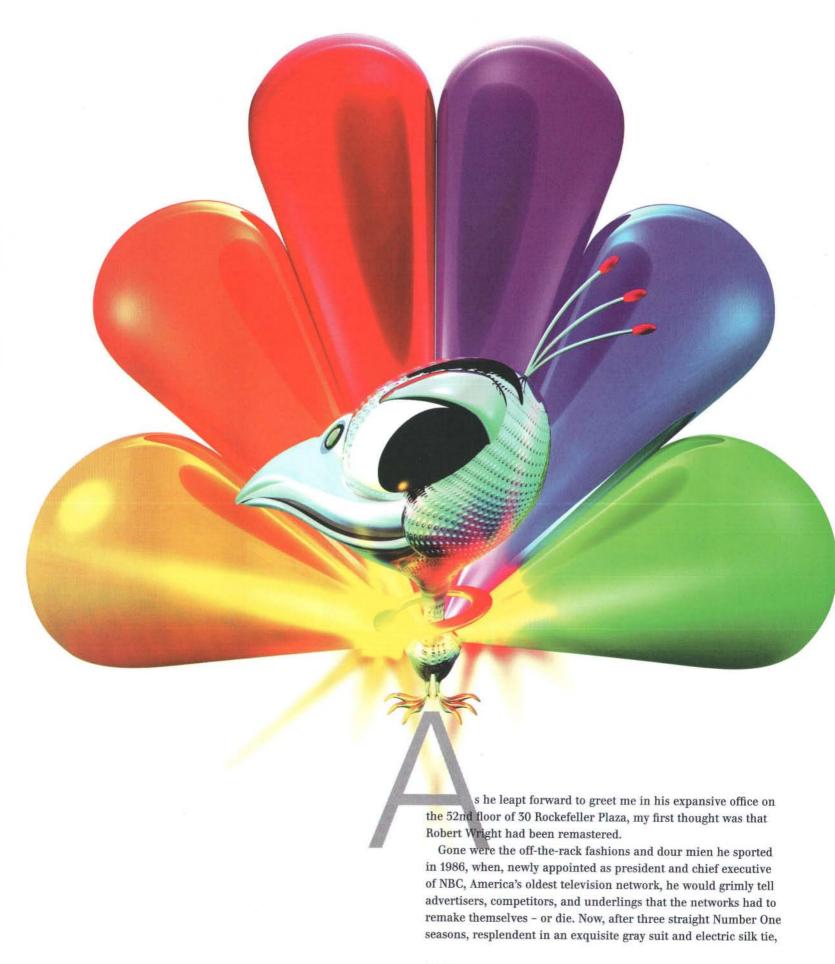
As Enderle puts it, "Bill is a great monarch but Steve is a much better manager." And the moment calls not for an emperor, but for a management virtuoso.

James Wallace is a business writer for the Seattle Post-Intelligencer. His most recent book is Overdrive: Bill Gates and the Race to Control Cyberspace.

Today's smartest broadcast networkers know the future lies in all-in-one infotainment. By Randall Rothenberg

Must See IP: NBC's Robert Wright (left), president and CEO, and Thomas S. Rogers, executive VP and chief strategist. ▶





Wright was in an ebullient mood.

For good reason. He'd just scored another triumph: NBC's portal play. Days earlier, the company had acquired a dusty search engine called Snap and promised to build it into a nationally recognized consumer brand. Almost immediately, the deal had paid for itself, as shares in Snap's parent company (into which NBC had also bought) soared. Valuations of other search services also skyrocketed, making it more expensive for NBC's competitors to follow suit. It was the latest move in a program Wall Street was hailing as the most brilliant convergence strategy among conventional television companies.

Yet for all his buoyancy, Wright, nervously tugging at a gold wedding band and pouring popcorn into his gullet, was still dwelling on his old fear: decline. While he talked with excitement about his company's evolution of the MSNBC cable-and-Internet business model, its experiments with Golf.com and NBC.com, and the portal wars, he quickly turned to the tale of Sylvester "Pat" Weaver, the NBC chief who invented the modern television industry. After leaving NBC in the 1950s, Weaver moved to California and became the president of a pioneer pay-per-view TV service. The movie studios waged a savage war to protect their interests. Weaver's enterprise – and the promise of a new kind of television – collapsed.

"I *like* to do the Pat Weaver stuff," Wright told me, almost defiantly. "I'm one of those people who tends to believe that what could happen will happen. But if your timing is off by what seems a small amount in hindsight, the whole thing can collapse."

Wright's preoccupation at first seemed odd. NBC was on track for a record \$1 billion in annual profits, while the five other broadcast networks were at best barely breaking even. His fixation, though, was astute. Alone among the conventional broadcast networks, NBC has conceded that television is not dying, but dead. Alone in the industry, NBC has staked its entire future on convergence – on the assumption that unlimited choices in entertainment, information, and transactions, in video, audio, and text, are moving inexorably onto a single home appliance, in a way that undermines traditional media economics.

And alone among television executives, Wright knows that his network, to this point almost uniquely positioned to capitalize on these developments, may dissolve if its meticulously crafted convergence strategy proves hollow.

"You can be the guy who is still trying to make buggy whips – or you can be the person who's always 10 years ahead and broke," Wright said. "Both of these are fraught with peril."

'Twas not ever thus. For most of this century, broadcasting enjoyed technological and regulatory protections that gave its proprietors oligopolistic market power. With only a few national networks to serve as intermediaries between viewers and advertisers, owning a network was like commanding a private mint. The lords of airspace stayed ahead of the technological curve by colluding to delay new product rollouts until the industry could adjust; network TV wasn't introduced until decades after

the invention of television, to allow the radio networks and ad agencies to plan for and control its disruptive influence.

Convergence technologies are different. Unlimited, ubiquitous, real-time, full-motion, personalized, integrated media fragment the monolithic audience into myriad pieces, subverting the rules by which conventional communications companies operate. New distribution technologies are introduced and revised as soon as the processing power and bandwidth allow, forcing media companies to swim in the swirling whitewaters, or drown. "Every single one of my clients is facing uncertainty right now," says Michael J. Wolf, an influential media consultant at Booz, Allen & Hamilton in New York, who counts NBC among his charges. "Every one is looking at and recognizing the threat, seeing the migration of their audiences' viewing time to new media. But they're still wondering about the business model."

Even in its most primitive form – the unified delivery of cable and broadcast signals into a single box – convergence has laid waste to the TV industry. In 1997, the share of the prime-time

audience held by CBS, ABC, and NBC, once above 90 percent, fell for the first time below 50 percent. To maintain their hold on increasingly distracted viewers, networks have had to multiply the fees they pay entertainment providers well beyond sustainable levels, pummeling their owners' earnings.

But even as profits are eroding, the playing field is becoming more crowded. Bud Paxson's Pax-TV network joined the broadcast fray this year; perennial posturer Barry Bob Wright & Co. realize that convergence is not about technology – it's a game of political intrigue, financial scheming, and industrial brinksmanship.

Diller intimates he, too, will soon launch a network. A study by Rupert Murdoch's News Corporation estimates that within the next 12 years Net-TV convergence will provide viewers with 1,000 channel choices – up from an average of 55 now. That estimate may actually be conservative, if you believe (as I do) that digitization, compression, new wiring, and satellite delivery will effectively transform any Web site into a global television network.

NBC has withstood the ravages of convergence through the crafty application of the profits spun off during the *Seinfeld* era by its broadcast network and its 13 owned-and-operated stations. Pushing relentlessly into alternative distribution, NBC is now among the top three owners of cable programming services, along with TCI and Time Warner, with stakes in such brand-name networks as Bravo and American Movie Classics. Its first cable network, CNBC, earned \$125 million last 256 ▶

New York editor Randall Rothenberg (randall@wired.com) is author of Where the Suckers Moon: An Advertising Story.



and the Art of Org Charts

By Jeff Greenwald

In search of excellence? asks Daniel Goleman. Start working with emotional intelligence.

### Wired: The mythical hero of Silicon Valley is the nerd - a brain trapped inside a geeky-looking body. Your research suggests otherwise.

Goleman: The stereotype of the tech expert with no social skills may be accurate. And I used to think these two factors were independent. But friends at places like MIT argue that people drawn into the technical fields spend many hours - particularly in adolescence - alone, absorbed at the computer, or in a lab. As they're increasing their technical understanding in math and science, they're missing out on a parallel track of social learning. They become emotionally de-skilled, and that pulls them back later in their careers.

### The person who seems to belie this point of view is Bill Gates, who by external appearances is almost autistic. He's hardly what anyone would call a failure.

Gates is a fascinating case. He has a fabulous drive to achieve, and that reverberates throughout his company. On the other hand, he's notorious for the worst of emotional intelligence. He yells, he's abrasive, and he doesn't seem to care how he's coming off. If he were starting at the bottom - if the playing field were level for Gates - he's not the guy you would pick to lead a team. He'd work for you, not run you. So what's the role of technical skill?

It's an entry-level requirement. You have to have enough to do the job - but it's not what sets star performers apart. A UC Berkeley study, started in the 1950s, followed a group of PhD students in science and the technical fields for 40 years. It turned out EI abilities were four times more important than IQ in determining professional success and prestige by the end of their careers. And in a study of managers who failed, it was always because of a deficiency of EI.

### Does our penchant for smartcards, smart homes, and PDAs encourage El in society, or impede it?

The early returns show a negative impact, particularly as it affects kids - the average level of EI has been declining among young people for the last 20 years. This generation spends more time than any generation in history staring at video monitors. It doesn't matter if they're doing educational CD-ROMs; they're not out playing with other kids.

### What about the workplace?

The increasing reliance on communication via the Web and email - if it replaces human touchpoints - weakens the fabric of connectedness that makes a company or organization work. That's why EI is so important in the high tech universe.

### How does El apply to people like Oracle's Larry Ellison who are more inspired by the Japanese "warrior mentality"?

Samurai were Zen students - they engaged more skillfully because they cultivated inner peace. EI is about being skillful, not squishy.

### What's today's most emotionally intelligent technology?

The Media Lab's Roz Picard, who wrote a book about 2001's HAL 9000, is investigating computers that can read emotions

of Future Perfect: How Star Trek Conquered Planet Earth.

in the user and adjust themselves accordingly. If you're frantic and uptight, they can make things easier. If you're enthusiastic and zeroed in, they'll up the level of challenge. They're user-friendly in the real sense of the word - which means they're emotionally intelligent, for machines.

### It's one thing to program a computer; how about humans?

EI competencies are learnable. In Working with Emotional Intelligence, I set out guidelines for training programs designed to make people better on the job, where the payoff is. A lot of programs out there - like these one-day motivational seminars, or doing ropes courses in the countryside - have little, no, or even a negative effect. Companies are wasting a lot of time and money on inappropriate solutions.

### Could good training rescue a troubled company - say, Apple?

EI is not the answer to every problem faced by an organization. There are market realities. But how well you face a market reality is determined by EI. Andy Grove, writing about Intel, makes a good point: The critical thing is how managers respond emotionally to a crisis. So often people panic, deny the crisis - or kill the messenger. A company has to be open to bad news, take it in fully, and respond quickly.

### What about other traditions that have a different way of dealing with emotions?

expressions of emotion, particularly of negative emotion - which means that people are getting eaten up inside without showing it. But I was amazed at Asia's interest in EI. In Taiwan, Emotional Intelligence is the best-selling book of all time. In Korea, they're starting to put EI curricula in the schools.

"We're very taken by the West," they told me, "and very influenced by your ideas and technologies. And here is Western science affirming our most deeply held values."

### Is El sort of bottom-line Buddhism?

It's very interesting. Buddhists read Emotional Intelligence that way. Christians tell me it's about Christianity. And Jews tell me it's a great book about Judaism. It may in that way reflect what Huxley called "the perennial philosophy," which itself reflects the basic neurological structures that govern human existence. My work is grounded in science, particularly neurological science. Apparently the eternal questions all the great religions are grappling with are the legacy of evolution: What do you do with destructive emotions? How Contributing editor Jeff Greenwald (jeffji@lmi.net) is the author can you live a good life, and have healthy connections to other people? How can you help future generations?

What a trick of fate: The way to get ahead in the age of the knowledge worker is not through raw brainpower, but by harnessing your emotions. Daniel Goleman, a Harvard-trained psychologist and former New York Times science writer, turned this idea into a household phrase with his 1995 blockbuster Emotional Intelligence. A primer on the art - and science - of selfmastery and social persuasion, the book remains an international best-seller, now translated into 30 or so languages (at this writing it's topping the charts in Turkey). Goleman's follow-up volume - Working with Emotional Intelligence (Bantam, 1998) In many Asian cultures you squelch - goes even further, providing a kind of moral philosophy for corporate America. His thesis: In today's technical fields, you need a highly developed set of soft skills to leverage your hard expertise. Now CEO of consulting firm Emotional Intelligence Services (www.eisglobal.com/), Goleman seems to be walking the talk; let him know what you think at goleman@javanet.com.



# MURDER By Scott Kirsner INTERIET

CHRIS MARQUIS was a 17-year-old Vermont hustler running a small-time scam online.

His virtual business was going great - until somebody killed him.

On the afternoon of March 19, 1998, a UPS driver named Armand Gevry delivered a cardboard box to the pea-green house at 3 Washington Street in Fair Haven, Vermont. Gevry lives two blocks away, and when Sheila Rockwell opened the door, she recognized him as the deliveryman who often brought shipments of citizen's band radio equipment to her son.

It was a cold, gray day outside – light snow changing to sleet changing to rain – so she quickly took the package from Gevry, thanked him, and shut the door. Rockwell, a weathered woman of 52 with hard blue eyes and wispy brown hair, carried the box down the hallway of her modest home.

Chris Marquis was talking on his new Ranger RCI 2990 radio with his girlfriend, Cyndi McDonald, when his mother brought the package into his wood-paneled bedroom. His 6-foot frame was hunched over the microphone on his desk, his dirty-blond hair was swept forward across his forehead, and a thin mustache fuzzed his upper lip.

Rockwell handed the 2-foot-long box to her son. She didn't recognize the return address, so she sat down on Chris's bed, curious to see what was inside.

Chris continued chatting with Cyndi. The name and address on the box - Samantha Brown, 1863 South High Street, Bucyrus, Ohio - didn't ring any bells for him either.

"I got a package in the mail," Chris told Cyndi. He'd met her two years earlier as a quiet, sweet voice on Channel 1. Cyndi was now in the 11th grade, a year ahead of Chris, but she attended school in Whitehall, the next town over. Their favorite date was a meal at the McDonald's on the far edge of Fair Haven.

IMAGES: PAUL FU

"What is it?" Cyndi asked. "Who's it from?"

"Hold on. I don't know," Chris answered, as he grabbed his jackknife from the holster on his belt and slit the box open. Inside was a slightly smaller box made of styrofoam.

"Well, it's probably a bomb, then," Cyndi joked.

The explosion knocked Chris and his mother to the floor.

To his acquaintances online, Chris Marquis wasn't a teenager living with his mother. He was 27 years old, a father, and the proprietor of a Vermont store called the CB Shack. That was the identity Mark Sischo encountered earlier this year on the RCI Federation Web site, where CBers post messages to buy or sell the well-regarded brand of radios – RCIs – made by Ranger Electronic Communications.

"Chris had a message up," Sischo, who lives in Michigan, recalls. "It said, 'Anybody looking to buy, sell, or trade radio equipment, email me.' I had some stuff that I couldn't sell around here, so I was gonna do a trade." After corresponding by email, Chris taught Sischo how to use Mirabilis's ICQ software so they could chat in real time. They discussed the relative merits of Rangers and Unidens and Cherokees and Cobras. Chris, who used "Psycho" as his email name and CB handle and dubbed himself "PhantomOp" on ICQ, revealed his real name to Sischo. He also griped about his wife, sent a digitized picture of his daughter by email, and pointed Sischo to a Web page he'd set up to advertise the CB Shack.

Eventually, the two began trying to work out a trade. They agreed that Chris would send Sischo a Galaxy Saturn Turbo worth about \$700, a couple other radios, and a few microphones and accessories. In return, Sischo would send three radios and microphones to Chris. Since the gear that Sischo was sending Chris was of lesser value, he also included a check for \$100.

After exchanging tracking numbers with Chris so each could verify that the other had, indeed, sent the equipment, Sischo shipped his box by UPS in early March. But when Sischo visited the UPS Web site and punched in the 18 digits Chris had given him, he got the message "Unable to track shipment." He checked the number and tried again. Same thing.

Certain that Chris had intended to con him, Sischo called UPS

March 16. "I am posting ads about that crook all over the internet...the address I have is Washington St. Fairhaven Vermont...DONT MAIL THIS LIAR ANY MONEY OR YOU WILL BE POORER BUT WISER!!!!!! If I can find someone to pay the 2 way airfare, I will go there and collect everyones money back, and give him some severe dental problems to deal with...Are You listening Chris?? When You see a 6 foot 5 inch dark haired man at Your door, You better duck 'cause I will be about to drop the maul...on You noggin dude......"



### "I got a package in the mail," Chris told his girlfriend, Cyndi, on the CB. "It's probably a bomb,"

and stopped delivery. He spoke to a representative of the company's security department, who asked whether Sischo knew anyone else who'd been burned by Chris Marquis. Sischo said he didn't but promised to see whether he could find others.

Sischo began posting messages around the Web and on Usenet groups. "Everyone who has been ripped off by Chris Marquis Email me immediately!!" he wrote to the readers of rec.radio.cb on March 14. The responses came quickly. Sischo heard from three or four people who had lost radios and money to the "proprietor" of the nonexistent CB Shack. One of them was NCTomCat, an America Online user who reported that he'd sent \$25 to Chris to cover the shipping costs of a radio that never arrived.

In addition to emailing Sischo, TomCat was posting threatening messages on rec.radio.cb. "He ripped me off too," TomCat wrote on

I could feel the building and windows vibrate," says Raymond Viger, Fair Haven's chief of police. Viger was on the phone when he heard the boom, and he slammed down the handset and rushed out the front door of the town's red-brick Municipal Building. The Korean War veteran knew it had been a serious explosion – the force was too powerful to have been a car backfiring or some kid lighting an M-80.

Scott Kirsner (kirsner@att.net) writes about technology from Boston's North End. He wrote "The Legend of Bob Metcalfe" in Wired 6.11.

Sitting inside the brick Municipal Building only 20 yards from the blast, Fair Haven chief of police Raymond Viger (right) knew it had been a serious explosion.



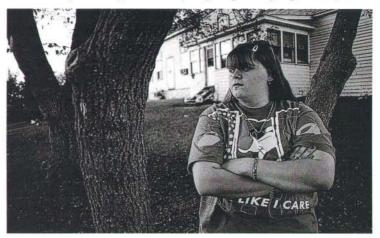


Standing on the front steps of the Municipal Building, which contains Fair Haven's town offices, its volunteer fire department, and its three-man police force, Viger faced the town common. On the left side was the Fair Haven Library, the Merchant Bank, and a row of shops. On the far side was a gas station, the Mallory Funeral Home, and the First Baptist Church. The right side was lined with big houses built in the 1800s.

It took about three minutes for Viger and Sergeant Jeff Lusk, who was riding in a patrol car at the time, to determine that the noise had come from Sheila Rockwell's aluminum-sided house, at the back left corner of the Municipal Building, not 20 yards from Viger's office.

"I could see fire," Sheila Rockwell recalls. "I was trying to put out these fires. There were disks on fire, and a lot of plastic. I was trying to find the telephone. Chris got up and ran for the bedroom door, but he just fell on his face."

Chris had several holes in his abdomen and burns and shrapnel wounds all over his face and neck. Most of his upper left thigh had been blown away. "I tried crawling over toward Chris and I couldn't," Rockwell says. "Every time I'd try to get up on my right knee, I'd



collapse." Rockwell noticed that her knee was bloody and that most of the fingers on her right hand had disappeared. She asked her son how badly he was hurt, but he didn't reply: "Chris was moaning. He wasn't answering me. Just moaning."

she joked. The explosion knocked him and his mother to the floor.



The blast at 3 Washington Street (left) tore apart Sheila Rockwell's right knee and took several fingers. Cyndi McDonald (right) met Chris Marquis on the air when he asked for a radio check; he was Psycho, she was Schoolgirl.

When Chief Viger and Sergeant Lusk stormed into the smokefilled bedroom, they found Chris and his mother lying on the bloodsoaked carpet. Chris was face down and unconscious. A cardboard box half-filled with styrofoam peanuts was nearby. Above Chris's computer station, a hole had been blown through the roof, and below it, a matching crater was carved into the floor. The plastic cover of his inkjet printer had been melted away.

Rockwell was coherent enough to tell Lusk that Chris had been standing right over the inner box when it exploded. While they waited for Fair Haven's volunteer rescue squad, Lusk asked Rockwell whether she or Chris was having problems with anyone. Rockwell told him that there was a guy in Indiana who was mad at her son, and who had been threatening to come to Vermont that weekend to collect some money Chris owed him.

There was silence on Cyndi's end after Chris keyed off his radio mike to open the package. She waited 20 minutes, but Chris never came back on.

She was distraught, because they'd been inseparable – on and off the air – since they'd met one day two years before, when Chris was asking for a radio check and Cyndi gave him one. He was Psycho, and she was Schoolgirl. They talked every day for a year. Then Chris asked when he'd be able to meet her. She said, "Whenever you come over," and he came over. Cyndi remembers the date: June 27, 1996.

"On the radio, he was laughing all the time, but he was quiet when I first met him in person. Shy, but nice," Cyndi says.

They'd set a different channel to meet on every night and chatted for hours about music, movies, school, parents. They talked about Chris's dream of opening up his own computer business. When Chris and his mother had to run errands, he and Cyndi would keep talking on a mobile radio in the van until he drove out of range and Cyndi's voice grew faint before disappearing.

Mark Cutsinger was the closest thing Chris had to a friend, aside from his mother and Cyndi. ("Everyone hated him," says Jeremy, a Fair Haven teen who knew Chris. "He was a punk. All he did was talk shit on the CB, just trashing people. He got beat up a lot.") But Cutsinger, who runs a radio/computer shop in Middlebury, a college town about 30 miles north of Fair Haven, shared Chris's passion for hardware. "Chris guided me through a lot of computer stuff, and I taught him about radios," says Cutsinger, a lanky, mustachioed biker who uses Gonzo as his CB handle. Gonzo would answer Chris's million and one questions – and Chris constantly hailed him on the air, by phone, by email, and over ICQ. He had grown up without a father figure, and he seemed to think Gonzo would do nicely. Occasionally, Chris's unending queries would grate on Gonzo's nerves, and he'd stop responding, but he had a soft spot for the kid.

In rural Vermont, people use CB sets in their cars and homes as a cheap alternative to cellular phones or pagers. In Fair Haven, you can get in touch with almost anybody – or at least his neighbor – by putting a call out on Channel 1. During long winters, conversations on the CB become a way of keeping in touch with friends, since it's

Chris had one of the most powerful CB setups around. He ran a Cherokee CBS-1000 base station and Ranger RCI 2970 mobile rig that he bought from Gonzo, along with a 300-watt linear amplifier (illegal for unlicensed users like Chris) and a high-quality Antron 99 antenna mounted atop a 50-foot pole. Chris's voice was well known to CB users in Fair Haven, Castleton, Benson, and Poultney, as well as Whitehall, New York, the town just across the border, where Cyndi lives. His audio signature – a digital clip of



### Five days before the explosion, according to an FBI affidavit, Chris Dean said he "was going

usually too cold and snowy to go out to socialize. "It's just people hanging out, like in a chat room," Gonzo says. "People have their own little channels, and they'll talk about anything from the weather to the sex they had the night before. It's just your typical rag-chewing, most of the time."

Truckers navigating the highways of Vermont also use the CB, of course, to find out about road conditions, speed traps, and directions to their next stop. They're usually on Channel 19 – what Gonzo calls "the workingman's channel." That's where they'd encounter Chris Marquis. Gonzo also first came to know Chris as a voice on the radio. Sometimes Chris called himself Psycho, and other times he went by Taz, for the tattoo of the Warner Bros. cartoon character he sported on his right bicep. "His whole goal was to get in there and destroy people verbally," Gonzo says of Chris.



UPS driver Armand Gevry (right), who lives two blocks from Chris Marquis's house, delivered the fateful box March 19,1998.





the Napoleon XIV song lyric "They're coming to take me away, hahaaa!" – could be heard at all hours of the day and night.

Chris would use "noise toys" that created obnoxious sound effects to drown out truckers seeking directions. He'd berate anyone who dared to challenge his dominance of the airwaves. "It went beyond teenage mischievousness," says Gary Cook, who runs the CB Connection, a shop on the outskirts of Fair Haven. "A lot of teenagers are on [the CB], but none are as abusive as he was. I would never dream of saying things like that – the language, the type of insults."

Like Sischo, Gonzo at first had no idea Chris was just a high schooler. But when Chris came up to visit Gonzo's shop sometime in 1996, he arrived in his mother's blue minivan, with her in the driver's seat.

"Chris got anything he wanted," Gonzo recalls. "If Chris walked in and said, 'I want this \$4,000 radio,' Sheila would find a way to



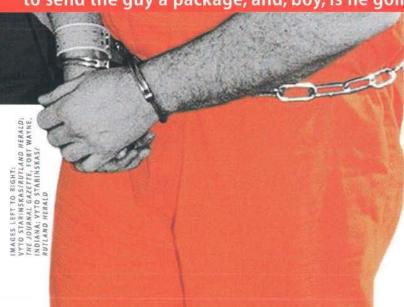
get it for him." From the start, the pair's carefree spending habits struck Gonzo as odd. Then, as Chris and his mother began to trust Gonzo more, they told him about frequent shoplifting sorties, and they bragged about doing all their Christmas shopping for free.

But Gonzo is not the type to rat on anyone – especially a customer – and

so he kept their confessions to himself. Instead, he took precautions. The one time he visited their house, he kept his motorcycle gloves on to avoid getting his fingerprints on anything that might be hot. "I wouldn't touch anything, and they laughed about that," he says.

to send the guy a package, and, boy, is he going to be surprised."

Police officers remove the packing



Indeed, based on a financial affidavit Rockwell filed in April, it's hard to understand how else she found the money to lavish her son with all the high-end CB gear, not to mention a brandnew Acer PC, a Nintendo, a Super Nintendo, a Sega, a fax machine, a professional DJ setup, and a TV and VCR for his room. On the affidavit, Rockwell states that she has been unemployed for nearly a year and that her main source of income is a monthly \$548 disability payment.

The disability, though, was Chris's. He suffered from retinitis pigmentosa, a vision disorder that rendered him legally blind at night and had begun narrowing his field of vision during the day. He had a blind person's cane, which he was supposed to use after dark, but he hated the cane, so instead he'd either stay inside at night or have Cyndi walk with him.

With expenses that exceeded \$1,000 a month, though, how does Rockwell explain all those extravagant accounterments? She says, simply, that she worked hard to give her son everything he wanted: "I did spoil him. He was the baby, and I didn't know how long his vision would last."

The reality may be more complicated. On January 3, Chris and his mother were arrested for shoplifting at the Ames department store in Rutland. Chris had stolen \$49 worth of CDs, gum, and pens, and Rockwell had taken merchandise, including 33 paint brushes and a Black & Decker drill-bit set, valued at \$91.

Rockwell contends that this was the only time she ever shoplifted and that neither she nor Chris knew what the other was doing: "We were in two different parts of the store. I didn't want him to know I was stealing." But Gonzo says that when he visited their house, Rockwell asked jovially whether he'd seen them in the papers and laughed about the low fine she'd received for the offense – only \$42.

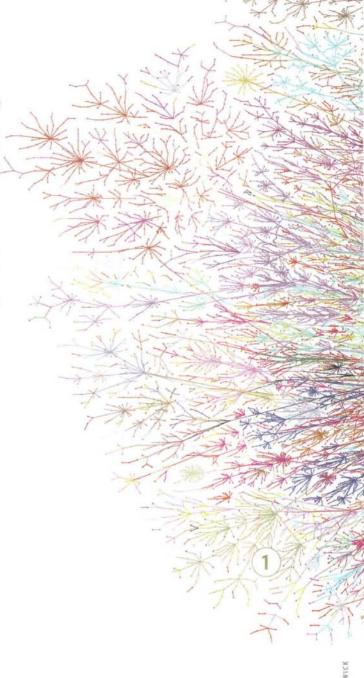
Eileen Lavigne, Rockwell's daughter and Chris's half-sister, says that petty crime had become a habit for the two. "There were times I would go shopping with my mother [and] she would not only directly steal, but she'd take the tags off one item and put them on another – and Chris was right there," Lavigne says. "She's got a serious problem. And I think [Chris] got the sense that if she was doing it and not getting caught, it was OK."

On March 19, Gonzo was listening to his ham radio when he heard there had been an explosion next to the Municipal Building in Fair Haven. At first, he laughed: "I figured Chris had probably just blown up a linear." When he learned it was a package that had exploded and that Chris and his mother had been sent to the hospital, Gonzo felt sure he knew who had sent it.

Chris Dean was well known at the Little Big Horn Golf Club in Pierceton, Indiana. The burly, 6-foot-tall, mustachioed 35-year-old 266

#### **The Scenic Route**

This abstract explosion of lines is a picture of the "tin cans and string of the Internet," explains Bill Cheswick. Every morning, the Bell Labs senior researcher runs a route tracer that charts the pathways among 61,000 routers around the world. Then, from their server in New Jersey, Cheswick and Carnegie Mellon grad Hal Burch crunch the data and plot it, creating a nongeographical map of the Net. In this image, the colors denote related IP addresses: The centrally located pinkish mass (7, opposite) is MCI - "the magnetic north of the Internet." in Cheswick's words. Overall, the map shows data relationships that are lost in numeric expressions, providing early warnings about congested areas, market opportunities, and Net growth. "Besides," says Cheswick, "the big color plotter wasn't getting used enough." Get another eyeful at www.cs.bell-labs.com/~ches /map/. - David Weinberger

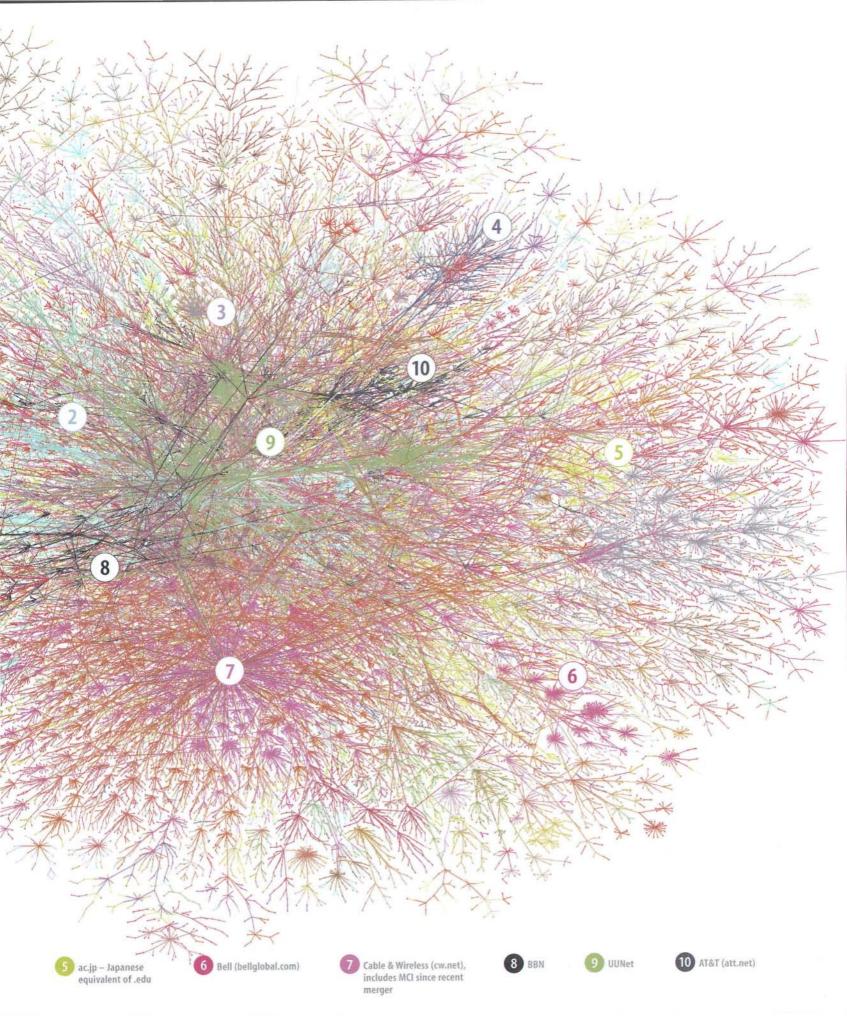












# **Fully Loaded**



## 1998 Range Rover 4.6 HSE

\$66,225
225 horsepower
8 cylinders
12/16 miles per gallon
6,148 pounds
5 passengers
0-60 in 9.9 seconds

WIRED DECEMBER 1998

218

# Fully Charged

The future of transportation turns out to be a

## bitchin' golf cart.

By Jacques Leslie



### 1996 trans2

\$6,800
3.5 horsepower
0 cylinders
30 miles per charge
980 pounds
2 passengers
0-25 in 4.5 seconds

t was a lovely, unorthodox concept, and in a more perfect world it might have been an instant success. The idea was to manufacture a battery-powered car that would occupy the middle ground between motorcycle and subcompact, a kind of glorified roadworthy golf cart, and by so doing promote neighborliness, livable communities, and environmentalism. It was a tool, in other words, for changing the world.

The car was called the trans2 – the idea being that all vehicles before it comprised "transportation1" – and its principal designer was Dan Sturges, who had been nursing visions of small, practical vehicles since he graduated from Pasadena, California's Art Center College of Design, the leading US trainer of car designers, in 1986. Two of Sturges's classmates went on to win acclaim as designers of the Dodge Viper and Porsche Boxster; Sturges was their offbeat counterpart, the alternative car designer. After graduation he stuck out a year at General Motors, then quit to try to bring his concept of a humble electric vehicle to market.

The short version of the trans2 tale is that after years of evolving designs and faint-hearted investors, Sturges and a committed set of backers launched a company in 1992, and by 1996 began manufacturing a 25-mph, 30-mile-range vehicle that looked like an oversize egg: Owners still call it the "eggmobile," the "eggcar," the "rolling Easter egg." The company sold 350 vehicles at about \$7,000 each, then found that the cars' body panels had begun sweating an oily liquid. The problem, which badly blemished the cars' finish, led to a recall that the firm could not afford. The company spent eight months trying to figure out what went wrong and hunting for a new supplier. Eventually a new panel-maker was found, but by that time trans2 had lost precious time and sales and run through much of its startup funding. The company's backers couldn't be persuaded to increase their investment. After selling about 700 cars and consuming \$12 million in investments, trans2 went bankrupt. Now

Sturgster out of water: "Brilliant young car designer" Dan Sturges, standing third from right, with fellow GM engineers in 1986.



Sturges calls the vehicles – about a quarter of which were sold overseas, to owners in Mexico, the Netherlands, Singapore, and Brunei – "dead eggs."

End of story - except that while trans2 collapsed, the concept it embodied, the neighborhood electric vehicle, or NEV, lives on, heartening Sturges with the prospect that his vision may materialize after all. Bombardier Inc., a \$5 billion-a-year, 40,000-employee Canadian company that manufactures Learjets, snowmobiles, jet skis, and several other modes of transportation, has begun selling its own NEV, and Global Electric MotorCars, a start-up in Fargo, North Dakota, bought trans2's assets and began producing its successor, the GEM, last May. Still other companies are planning their own NEVs.

Acknowledging the emergence of this new kind of car, the National Highway Traffic Safety Administration in June, announced a new vehicle class, the low-speed vehicle, marking the first time the agency has created a new car category since it established standards in 1967. And now Sturges wants to be the Johnny Appleseed of NEVs. (And if you're wondering: Dan Sturges says that "technically," he's not related to Preston Sturges, the '40s director and writer of comedic studies of human nature like Sullivan's Travels. But he adds that in a way, he feels everyone is related to the filmmaker who, come to think of it, would have a good time with Danman's story.)

All of which goes to explain why Sturges and I went on a six-day, seven-flight, 5,898-mile hejira to a trio of the nation's odder repositories of electric vehicles, and of human behavior, for that matter. In



Curbed in Mecca: Dan inspects a NEV-friendly bike lane in Palm Desert.

all three locales – Palm Desert, California; Celebration, Florida; and Putin-Bay, Ohio (situated on South Bass Island in Lake Erie) – we would find trans2s in action, Sturges assured me. For him, each trans2-occupied vista presumably would constitute a veritable madeleine of bittersweet memory, while I would be afforded a glimpse of the Sturgean vision of the transportation future.

That glimpse took some hard looking. In two different states, I saw 75-year-old women wearing pink halter-tops. I saw a community where every home must conform to one of six prescribed architectural styles, meticulously defined down to the quarter inch, and where Muzak is pumped out of hydrant-like speakers that appear every 10 yards or so on the sidewalks of the town center. I talked to a bank manager wearing a Mickey Mouse

tie. I met a 65-year-old MIT graduate who, owing to his unvarying preference for green coveralls, is known as Gumby. I rode an electric-powered bicycle, a golf cart, a trans2, a Bombardier NV, a GEM, and the full-size, teardrop-contoured General Motors electric car, the EV1 (a blast). I saw a dozen people ice-skating on a rink inside a shopping center in a town where the temperature breaks 100 degrees five months out of the year, and where, on the day I beheld this prospect, a thermometer in our rented Volvo hit 115. I visited a home graced with three electric vehicles, two of which were used indoors. And on a Saturday at 2 a.m. in a 24hour Meijer department store in Sandusky, Ohio – where, our airline having lost our luggage a couple of hours earlier in Cleveland, the Sturgster and I had stopped to buy toothbrushes - I saw a woman in front

of me in line buy a lacy bra, lacy panties, and a gallon of white paint.

But what I'm not certain I saw, even after six days of Dan's persistent - no, let's be frank and call it obsessive – lecturing, is a plausible preview of a national transportation system featuring NEVs. Danman his friends actually call him that envisions a transportation network in which cars join the information revolution: "Wires and Tires," he dubs his notion. It calls for matching vehicles to their task, a significant break from the one-car-fits-all mentality that characterizes car ownership. Instead of a conventional car, a household would own a NEV at a savings - in purchase price, maintenance, and fuel - of many thousands of dollars a year. People would run neighborhood errands in their NEVs so that they'd no longer be driving 11/2-ton cars to pick up 2pound quarts of milk. When they needed a bigger car or one with greater range, they'd drive their NEVs to a car-sharing station, where an appropriate car would be reserved.

Alternatively, people could drive NEVs to a transit terminal, leave them in the parking lot while they took a bus or subway, and at the other end pick up another NEV that they'd drive the rest of the way to work. Back in the neighborhood, telecommuters could drive their NEVs to local work centers equipped with high-end office gear. The centers would double as drop-off points for parcel shipments, thus eliminating the most costly segment of such deliveries - bringing packages to recipients' front doors and substituting the zero-emission NEV for the highly polluting parcel





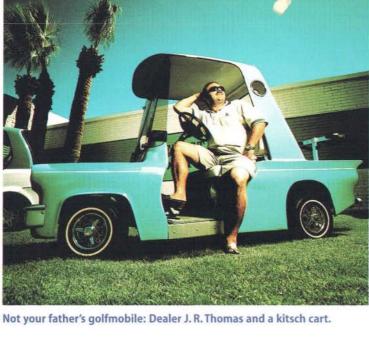
Showroom of the future? Electric Car Distributors in Rancho Mirage, California (far left); semi-satisfied trans2 owner Wyman Stackhouse.

truck for the final leg of the trip.

If it sounds unlikely that many people would give up their only conventional car for a NEV, consider that 40 percent of American households own two cars and another 20 percent own three or more. Wires and Tires envisions owners keeping conventional cars for longer trips and acquiring NEVs for around-town use. These short trips might seem inconsequential, but, environmentally speaking, they're not: About half of all car trips cover less than five miles, according to Daniel Sperling, director of the Institute of Transportation Studies at the University of California, Davis. If those miles are driven in gasoline-powered cars, the resulting pollution is all out of proportion to the distance traveled. In his book Future Drive: Electric Vehicles and Sustainable Transportation, Sperling estimates that emissions from gasoline engines are 10 times higher for short trips, when catalytic converters are still cold, than on longer trips.

Rounding out the Sturgean vision, local governments would accommodate NEVs, too: They would designate streets with speed limits of 35 mph or lower on which NEVs could drive, and they'd create miniature parking places just for NEVs. To encourage NEV use, the vehicles would be exempt from parkingmeter charges, and states would waive sales tax and registration fees.

or now, however, NEVs' future depends on finding footholds in communities that seem to have an obvious affinity for them, and that's what led Dan and me to Palm Desert, a town of 34,000 perma-



nent residents (49,000 during the tourist season), 27 golf courses, and 47 home-owners associations, many of which represent gated communities. A town official declined to estimate just how many gated communities Palm Desert has, expressing concern that the figure might suggest "exclusivity." Exclusivity? This is a town that has a golf course for every 1,259 people, names its streets after Dinah Shore and Frank Sinatra and Fred Waring, refers to one of its main thoroughfares as the Rodeo Drive of Palm Desert, and consumes water with almost exhibitionistic zeal. The town looks a little like a Moon settlement, or a musty canvas on which some witless artist has splashed a few bright green streaks, mustache-on-Mona Lisa style. The terrain is varying degrees of brown, thoroughly barren and forbidding

except where sprinklers are mainlining the lawns and golf courses that constitute a fair-size chunk of the town. Many stores have installed misting machines at awning level outside their entrances, raining dew over prospective customers and creating little pockets of rain forest in the midst of blast-furnace aridity. At Marriott's Desert Springs Resort and Spa, which could be called the Beverly Hills Hotel of Palm Desert, we saw golf course sprinklers running at midday. (Never mind the three-story waterfall in the lobby.) Considering that the temperature was then in the one-hundred-teens, the sprinkler water chiefly served to boil the grass. It was a joke that Danman didn't entirely appreciate: This environmentally preposterous place was home to the nation's most advanced golf-cart transportation program - and therefore a

possible niche for NEVs.

Dan and I met on Day One at Ontario International Airport, an hour's drive from Palm Desert. also an hour from Los Angeles, transportation nightmare and the source of the brown smog in which we were engulfed. For a man of 35, Dan looks young and unused: At 5'6", he appears not quite fully grown, and his face, accented by tousled dark-brown hair and a trim beard, looks fresh and round. Almost by definition, any well-regarded car designer evokes the sleek look of a Ferrari. But not Danman. His attire brings to mind a beaten-up VW microbus with peace decals on the windows and painted flowers on the sides. On this day he was wearing a backward-facing baseball cap, untucked T-shirt, shorts, and sandals: his Peter Pan ensemble. I soon learned that this was his customary garb except when meeting, say, a member of the Toyota Motor Corporation board of directors.

It didn't take long for Dan to get started on his favorite subject: NEVs may be scarce on the nation's byways, but in conversations with him, all roads lead to them. We were standing at an airport counter, trying to rent a car, waiting for a Hertz agent to correct a \$10-a-day overcharge. "Car sharing would simplify this a bit," said the Sturgster. "You'd have a smartcard, which would open a key box, which would flash on the right key, which would tell you what stall ..." - the logical extension was that Hertz would have to go out of business."The program could even use the Global Positioning System, so they'd know where you left off the car, and then they'd pick it up."





Charge it (from left): Sucking up current in Celebration; Rob and Steven Kaczmarczyk pilot a trans2 in the Disneyfied downtown; a Bombardier takes on a truck.



Not the least of Danman's skills is that he's a tireless and, all things considered, successful marketer, of himself perhaps more than his designs. A decade ago, when he was 25, an article in Automobile Magazine called him "a brilliant young car designer," though it also predicted that his idealism would founder "against the intractable imperatives of human nature." A year and a half later, The Wall Street Journal reported on his three-wheeled, open-air "platform vehicle," even though all Dan had to show was a prototype.

As we drove, Dan explained some of his unused marketing ideas for the trans2. The car required consumers to think about transportation in a new way, so he envisioned a trans2 caravan creeping out of the Pacific Ocean, like the first amphibians, and driving all the way to Palm Desert. Of course, the journey would require frequent recharging stops: Once the trans2 uses up its charge, it takes six to eight hours at an electric outlet to replenish its batteries. He also imagined relating the benefits of driving slowly in a trans2, calming traffic and taking in the sights, to the pleasures of slow sex. Or how about an ad depicting an 85-year-old crone trying in vain to commit suicide in her trans2 because she couldn't find the exhaust pipe? Dan called the last two concepts his "sick and twisted advertising ideas," but it wasn't entirely clear that he was joking.

When we entered Palm Desert, the highway seemed to turn into a long, broad, destinationless driveway. On either side were interminable grass strips and walls, behind which apparently were actual people, play-



Road rave: Danman (foreground) with Celebration's trans2 faithful.

ing golf and shopping and interacting in their golf carts, all the while basking in the security of their engatedness. These people we couldn't see are part of a national trend. In Fortress America: Gated Communities in the United States, coauthor Mary Gail Snyder estimates that more than 8 million Americans lived in gated communities in 1996; now, a mere two years later, she thinks the number is at least 9 million. Inside many of these communities, golf carts are the vehicle of choice. The impetus for Palm Desert's golf-cart program, in fact, came from the desire of gated residents to have intercommunity relations, so to speak, by driving their carts on and across municipal streets to visit friends in nearby compounds. The result was a program launched in 1993 that earned Palm Desert a national reputation

for environmental sensitivity and turned the town into the electricvehicle capital of America. And yet, considering the modest size of the Palm Desert enterprise, all the program really seems to signify is electric cars' lack of impact nationwide. Palm Desert claims that by substituting electric vehicles for gasoline cars, the town eliminates 5 tons of pollutant emissions per year - even though only 200 of the town's 3,500 individually owned golf carts are registered in the program. The town's streets weren't exactly teeming with golf carts, either. We saw street lanes designated for golf carts and bicycles, but the only electric vehicles we saw in them were the ones we drove.

Which was fun. In pursuit of a comprehensive Electric Vehicle Experience, Dan arranged for us to drive a GM EV1 in Palm Desert. This was far from the concept of a NEV it could go from 0 to 60 mph in less than 9 seconds - but what made the EV1 a kick was that it could go so fast so quietly. It even had a backup beeper, like a truck, to alert the unsuspecting to move before they got flattened. On the other hand, we found ourselves constantly checking the range gauge to see how many miles we could go before recharging. And the two things that used up the charge most quickly were acceleration and air conditioning. You had 30 miles or so in which to play around, or you could swelter and drive parsimoniously and edge the range all the way up toward the maximum, 79.1 played around, and didn't dare tell Danman that after the EV1, a NEV would be a letdown.

During a midafternoon lunch at an overpriced franchise restaurant on the Rodeo Drive of Palm Desert, Danman handed me a thick packet of Dan-related materials, something he did every few days, and discussed his "floating aluminum tent," which was depicted in photographs inside. It was another egg. It looked Buckminster Fulleresque, which wasn't totally surprising, since Fuller is one of Dan's heroes. From the outside, it appeared to be an aluminum cauldron covered by a translucent dome, a metallic pod in the middle of a forest. The pod was suspended four feet off the ground, and an interior ladder led to a second floor. It suggested a tree house, yet it

Jacques Leslie is the author of The Mark: A War Correspondent's Memoir of Vietnam and Cambodia. He wrote about hydrogen fuel-cell cars in Wired 5.10. Volt, revolt: The NEV's Achilles' heel

- the battery pack (near right);
on South Bass Island, hard-drinking
vacationers stage a NEV rally.





could be folded up to fit on a car's roof. Dan said he designed it in 1990 during a monthlong gondoladesigning stint in Olten, Switzerland. During the day he worked on ski gondolas, which was what he was getting paid for, and at night he and a German-speaking engineer designed the "egghouse." Danman didn't speak German, but the engineer knew two English words - "beautiful" and "shit" and that was enough. He shipped the creation back to northern Michigan and reassembled it in a forest near his home. He periodically spends the night there. He brings his music with him, something by Peter Gabriel or maybe the Beastie Boys, and persuades himself that he's floating. The design, in fact, fulfilled his favorite fantasy: floating in a bubble.

In Palm Desert, little things kept going wrong, things that suggested the insubstantiality of electric-vehicle consciousness. That night we tried recharging the EV1 at a specially installed charging station at our hotel, but when we returned the next morning, the batteries were still low. We drove the car to the Marriott, which had a more advanced charger, but it was locked. It took half an hour to get the attention of two hotel security men, who pronounced the lock broken. They fetched a locksmith, who determined that the desert air had dried it out. The security men said that since the charger was meant for public use, it shouldn't have been locked in the first place, but that apparently hadn't mattered until now, as, according to the locksmith, this was the first time anyone had



Gone 'lectric: Put-in-Bay's Fran LoPresti and her brace of custom carts.

tried to use it. When the lock was fixed, one of the security men alluded sarcastically to the "long line of cars" awaiting recharging, but Danman wasn't amused. "It's a whole new deal with these cars," he said.

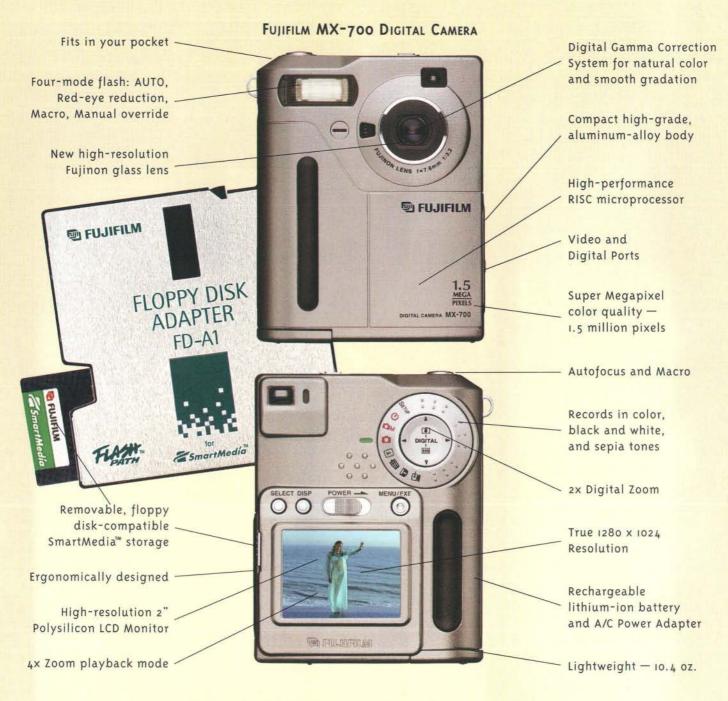
We left the EV1 there, tethered to the charger, and drove off in a Bombardier NV, which Dan also had lined up for our use. In the menagerie of NEVs, the Bombardier is the camel to the trans2's horse: It's the same idea, but without the grace - heavier, boxier, rear-wheel drive instead of front-wheel. But what the Bombardier has behind it is a vast reservoir of capital, something the trans2 never had. In 1993, Bombardier Inc. offered to buy out trans2, but the deal fell through in part because trans2 executives considered the price too low. Bombardier wound up designing its own NEV, while trans2 tried to compete

on a mere \$12 million investment base. If the sweating-panel problem was the immediate cause of trans2's demise, its lack of capital was the underlying one. It forced trans2 to scrimp, sometimes designing without a full-time engineer. It also led the company to try distributing the vehicles through car dealers on the assumption that they'd be more likely to pay trans2 promptly than golf-cart dealers, who were notorious for slow repayment. That choice turned out to be a bad one, for the auto dealers had no experience in selling small electric cars and in any case preferred to sell their familiar conventional cars.

As it happened, Palm Desert figured prominently in both trans2's rise and fall. In 1994, Dan brought a prototype to a Palm Desert street corner and videotaped passersby as they gave it test drives. So "exuber-

ant" were their reactions, he said, that they were taped and displayed in a video that helped raise the company's first major investment. But when the trans2 went into production, the company's choice for a Palm Desert dealer turned out to be disastrous. For one thing, he tried selling the vehicle as if it were a conventional car, pressuring customers to buy before they'd had a chance to understand the NEV concept. According to trans2 executives, the dealer was also a thief who reimbursed the company for only a fraction of the vehicles he sold and then absconded.

By the time of our visit to Palm Desert, Danman was much higher on, say, Coronado, the peninsula connected by bridge to San Diego, where he nearly persuaded the local high school to make NEV marketing a part of the curriculum. Coronado is made for NEVs, he said: The streets form a nice grid, and 35 is the highest speed limit on all but two of them. Palm Desert, on the other hand, "played an important role, but I don't expect to see huge successes here." Considering the golf-cart program, I couldn't quite grasp the reason for Dan's disenchantment until we talked with Lisa Constande, the town's environmental-conservation manager. It became clear that she harbored negative thoughts about NEVs, as evidenced by her declaration that they were not allowed in Palm Desert's golf-cart lanes. Her justification was based on a blurry line drawn between NEVs and golf carts. NEVs typically go between 20 and 25 mph, she said, while many golf carts are manufactured to go 272 ▶



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Le Guin, and Pat Cadigan, who often have boxes of their books in their basements.

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– Mark Frauenfelder

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Good afternoon. Welcome to Portico," a sexy female voice intones. "You've reached the number for Jon Kaufthal. I'm handling all his calls for the moment – may I ask who's calling? Would you like me to try to find him for you, or should I take a message?"

Thus begins the unsuspecting caller's introduction to Portico, a service aptly described by its creator as a "virtual assistant." And while Portico won't type or fetch coffee, it does a surprisingly adequate job of filling in for an assistant of the nonvirtual variety.

Tell Portico where you are and she'll forward your calls, much like rival services Wildfire (www.wildfire.com/) and Webley (www.webley .com/). But Portico one-ups the competition by smoothly integrating other areas of your life. For starters, a version of Motorola's TrueSync will sync Portico with, among others, Outlook and your PalmPilot, allowing it to understand phrases like "Call Steve Andrews at work" and "Get me Drew Anton's email address."





Portico rises to the challenge of any modern worker's scheduling needs.

She'll manage your schedule, too – just ask, "Do I have any appointments today?" And when Portico reminds you about your lunch, tell her to switch it to Wednesday. Next time you sync, the change will be reflected in your records. The service takes advantage of a secure, password-protected Web site that mirrors her telephone counterpart, even delivering voicemail via RealPlayer.

Portico's also got other tricks up her sleeve, like getting stock quotes and newswire stories. When a piece on Microsoft comes up, say "Fax that to Janet Reno."

So what's the catch? Not much. Portico is priced lower than her inferior competitors. Wildfire has got Portico beat with its ability to set up conference calls and whisper the name of one caller when you're on the phone with another, but Portico's overall feature set puts the others to shame. More than just a cool toy, Portico makes technology do something useful: simplify your life. – *Jon Kaufthal* 

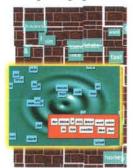
Portico: \$19.95-149 per month. General Magic: +1 (408) 774 4000, www.genmagic.com/.



#### **Digital Wordsmith**

vou stare for a moment, planning to tweak a minor phrase. And then, without warning, you're standing naked in your kitchen, hopped up on caffeine and Doritos at 2 a.m., your synapses firing with Jack Kerouac-inspired intensity, laughing maniacally. Bwah-ha-ha!

OK, maybe you haven't gone that far. But you love magnetic poetry. Now, the same folks who let you freak out houseguests by mutilating the English language want to



#### Poetry in motion.

usher your creativity onto the computer screen with Electromagnetic Poetry. The cyber version allows you to drag and drop hundreds of random words into dadaist succession. You can specify subject matter or choose from six languages — all against a backdrop of freaky wallpaper. It's not the next *Tomb Raider*, but it's much cheaper than most other addictions. — *Michael Grebb* 

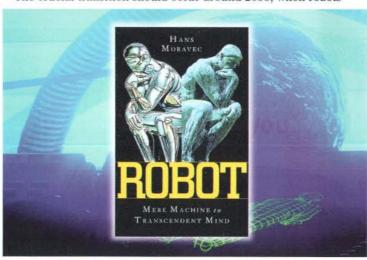
Electromagnetic Poetry: \$29.95. Electromagnetic Poetry: +1 (651) 228 9141.

#### **Redundancy Has Its Virtues**

Robot is a dramatic, awe-inspiring prophecy of the human future by Hans Moravec, computer scientist and robotics guru extraordinaire. Wired readers sampled Moravec's vision in "Superhumanism" (see Wired 3.10, page 144). His new book amplifies and substantiates that vision in concise, simple, yet elegant prose.

Moravec argues that the concept of work was unknown before agriculture and the industrial revolution and that we'll get rid of it permanently within a few decades, when smart machines free us not only from household chores, but also from exhausting tasks such as writing computer software or managing corporations. Contrary to popular fears, we'll celebrate our redundancy because, as hunter-gatherers, indolence and unemployment are part of our evolutionary heritage.

The crucial transition should occur around 2030, when robots



Hans Moravec sees humanity's future, and he's not afraid to talk about it. start basing decisions on internal ruminations rather than trial and error. After 2040, machines will display most human attributes. By 2100 rogue intelligences will adopt drastic measures to increase their processing power – perhaps using sub-subatomic particles for bit manipulation. This will enable machine entities to run simulations of the 20th century. In fact, we may be living in one right now.

Robot is an uncompromisingly radical synthesis of sociobiology, computer science, and philosophy. Some found Moravec's 1988 book Mind Children far-fetched or even repugnant; yet its portrayals of biology reworked by machines are beginning to seem commonplace, which is a measure of Moravec's ability as a futurist. Robot paints a headbending but persuasive picture of our next 50 years, augmented with fascinating fragments from the more distant future. – Charles Platt

Robot, by Hans Moravec: \$25. Oxford University Press: www.oup-usa.org/.

#### A Case for Transvestites

any have heard of Edward D. Wood Jr.'s 1953 transvestite drama Glen or Glenda, but few have seen it in its entirety. For those who know it only by reputation or from isolated snippets seen in documentaries, Englewood Entertainment has brought this beauty out on video.

In Glen or Glenda, the filmmaker himself plays the broad-shouldered, masculine Glen, who struggles with his secret life of blond tresses and angora sweaters. Unable to tell his horse-faced fiancée about his bewigged second persona, Glen suffers through expressionistic nightmares until a somber fellow transvestite and a humorless shrink set him on the straight and narrow. Glen or Glenda is typical of Ed Wood films:



Ed Wood's treatise on the virtues of cross-dressing.

purple dialogue, cheapo production, a drugaddled Bela Lugosi barking incoherently on the sidelines, and a heavy air of philosophical introspection mixed with nutty pseudoscience. Yet the film, in many ways, is shockingly ahead of its time: A brief yet completely mature sequence of a thwarted gay liaison and the repeated use of the word homosexual are highly unusual for a 1953 production.

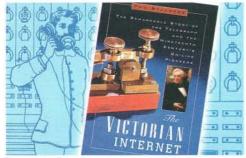
Some have unfairly labeled *Glen or Glenda* one of the worst films ever made. Nothing is further from the truth: This eccentric and erratic little flick is much too intriguing and entertaining to earn the mark of the skunk. – *Phil Hall* 

Glen or Glenda: \$19.95. Englewood Entertainment: (888) 573 5490, www.englewd.com/new.htm.

#### **History of Hype**

The Internet is supposed to be one of those quintessentially '90s things, like Russian millionaires or cloned sheep. Films and novels drop it in for instant contemporary cred. TV news makes stories out of people having babies, taking their clothes off, and other age-old activities – which magically become interesting or relevant as soon as the phrase "on the Internet" gets tacked on the end.

So Tom Standage's little book *The Victorian Internet* might be something of a bummer to all those who still think that having an email address guarantees their status as hipsters. Standage, a science correspondent for *The Economist*, tells the story of the 19th-century communications revolution – and it all sounds strangely familiar. Visionary geeks have a good idea, something along the lines of, "Hey, wouldn't it be cool to be able to send messages faster than the speed of a messenger on horseback?" They call the concept telegraphy ("far-writing"), come up with a device that sort of works, and try to interest reluctant governments and brass-hat military types in funding



The New Revolution: Haven't we been here before?

it. The British and French build systems that sound bizarrely like steampunk Arpanets, but eventually it takes corporate investment, in the form of railroad companies, to turn a marginal form of communication into a sensation that changes the world.

There's even a boom, just like our '90s version. Within a few short years, from the mid-1840s to the mid-1850s, telegraphy mushrooms all over the world, bringing with it all manner of weird cultural events, from political struggles about encryption to (believe it or not) online weddings and teleconferencing, Businessmen complain about information overload and police worry about law-enforcement implications. Standage tells his fascinating story in an engaging, readable style, from the moment a bunch of Carthusian monks get suckered into a hilarious human electrical-conductivity experiment in 1746 to the telegraph's eventual eclipse by the telephone. If you've ever hankered for a perspective on media Net hype, this book is for you. - Hari Kunzru

The Victorian Internet, by Tom Standage: \$22. Walker and Co.: +1 (800) 289 2553.

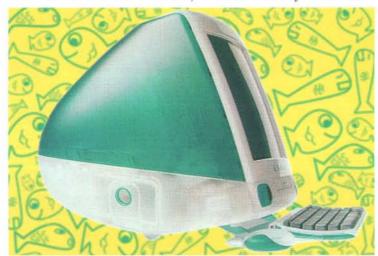
#### **Baby Blue**

t looks like Barbie's computer."
"It should have fish swimming inside it."

"I want one. I don't even like Macs, but I want one."

New computers at Wired Digital usually go as unnoticed as new chairs. But the iMac now occupying our front desk compels everyone to comment. Designers, engineers, and FedEx drivers gush whenever they lay eyes on it. iMac's curvaceous lines and attention to detail have the same inexplicable emotional appeal as a New Beetle. Or better yet, a newborn.

It's about time a computer makes us fawn over it. The original 1984 Mac made the personal computer an acceptable consumer item, thanks to its toasterlike packaging and simple operation. Nowadays, when the PC is a required desktop centerpiece, iMac is the first computer designed to act its part. Its cherubic rotundness invites parental doting and avuncular inspection from any angle, not just the front. The translucent blue color scheme, which seemed risky in advance



Head-turner: The iMac gets looks from all corners of the office.

publicity photos, works surprisingly well in the flesh – er, plastic. We found ourselves hunting through drawers to find network cables and mousepads that complement it. To our delight, we discovered that a standard white 10baseT line and a blue Hello Kitty wristpad match the iMac perfectly.

Unfortunately, the software inside this huggable package isn't much different from last year's Apple offerings. Performance is improved noticeably, but otherwise it's pretty much the same operating system. Internet access is made new-user friendly by a talking setup program and a bundled ISP offering. After a couple of system lockups, however, one office cynic deemed iMac's best feature to be that "it reboots faster." Apple's long-delayed OS replacement and some new killer apps are necessary to inspire another 1984-style revolution. Meanwhile, since most of us will be stuck running Office 98 no matter what computer we buy, we might as well look good doing it. – *Paul Boutin* 

iMac: \$1,299. Apple: www.apple.com/.

#### Seeing Ear Theatre

Id-style radio dramas may make a comeback — thanks to the Sci-Fi Channel's Seeing Ear Theatre site. Surfers will find an audio omniumgatherum of science fictional selections here, from original stories to classic radio shows such as *Mercury Theatre* (Orson Welles, anyone?) and Dimension X.

The Originals section features stories by SF writers such as Harlan Ellison, Gregory Benford, and James Patrick Kelly, given voice by familiar SF thespians like Star Trek's Marina Sirtis. Even ex-wonder-



Sci-fi for fans.

boy actor Mark Hamill has found a part here, lending his vocal cords to, of all things, Franz Kafka's "The Country Doctor." And you thought he'd never top Star Wars.

The more literary-minded can delve into author readings by such luminaries as Neil Gaiman, Ben Bova, Frederik Pohl, and, ahem, Walter Koenig (yes, Star Trek's Chekov wrote a book). Not a bad place to spend your daily lunch surf — especially if you close your office door and turn up the sound. — Craig E. Engler

Seeing Ear Theatre: www .scifi.com/set/.



### DR. JOHN Anutha Zone (Virgin)

After a somnambulant decade, Dr. John, whose "Night Tripper" persona of the late '60s delivered a steamy gumbo of Creole funk, swamp rock, blues, and jazz, returns to voodoo vamp. The lighter fare of "Why Come" rolls in inanity — "If adults commit adultery, do infants commit infantry?" Yet the darker "Voices in My Head" is so swampy you'll be peeling moss off your skin.



#### **BURT BACHARACH**

#### The Look of Love: The Burt Bacharach Collection (Rhino)

With his achingly melodic songs featured on the soundtracks for *Austin Powers* and *My Best Friend's Wedding*, a recent star-filled TNT tribute, and his sublime Elvis Costello collaboration, the 70-year-old Bacharach has been reanointed as the king of tuneful pop. This three-disc, five-decade box of 75 hits and misses shows why.

The Look of Love includes the silly ("Close to You"), the cheesily delightful ("What's New, Pussycat?"), the plucky ("Promises, Promises"), the heartbreaking ("Walk on By"), and the desperately heartbreaking ("God Give Me Strength" with Costello). — Beth Johnson



#### LIDA HUSIK

#### Faith in Space (Alias)

The concept of a punk rocker drifting into ambient techno isn't new — think Moby — but few have made the leap with as much grace as Lida Husik. Featuring her rich, sensuous voice, which merges '60s pop with dreamy electronic sound-scapes, her seventh album dives into club beats and oceanic washes of synth sounds.

With longtime techno producer Beaumont Hannant in tow, her cabaret dance pop marks the same territory as Madonna's Ray of Light, but with a less chilly approach and none of the self-righteous armchair spirituality. Not that she's given up her punk roots entirely: The album closes with a soothing take on the Jam's ballad "Monday." — Mark Athitakis



#### VAST

#### VAST (Elektra)

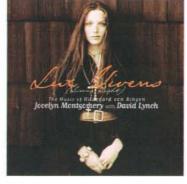
Still equate goth rock with white makeup, dreary black duds, and the Sisters of Mercy? Maybe it's time for VAST – Visual Audio Sensory Theater. Think Nine Inch Nails crossed with Depeche Mode. Jon Crosby's guitars are thick and nutritious, his Bono-like vocals littered with samples of Gregorian chant and Bulgarian women's choir. Abandon your Bauhaus and your Fields of the Nephilim: VAST marks the second coming of goth. – Colin Berry





#### LO-FIDELITY ALLSTARS How to Operate with a Blown Mind (Skint)

A raucous pastiche of hip hop beats, funk bass lines, disco hedonism, and postpunk attitude, England's Lo-Fidelity
Allstars are already a smash back home. Their mix of rock and electronic dance music also seems ripe for American audiences. With an aggressive, not-angry delivery, lead singer Wrekked Train unleashes anthems for the chemical generation. Yet his rag-tag lyrics cannot hide an infectious sense of humor. — Tamara Palmer



### JOCELYN MONTGOMERY WITH DAVID LYNCH Lux Vivens (Mammoth)

Hildegard von Bingen, the 12th-century German mystic, was a nun, painter, visionary, and composer of religious music. In the past decade, interest in her life and music has exploded, and director David Lynch (Twin Peaks, Lost Highway) is the latest to hop on her mystical bandwagon. Here he collaborates with Jocelyn Montgomery. whose exquisitely plaintive voice takes on an extra measure of melancholy as it drifts through these haunted soundscapes. Lynch is one of the few musicians capable of taking liturgical music and making it sound dissolute: His production turns von Bingen's intentions inside out. Instead of building a stairway to heaven, Lynch and Montgomery give you a gentle push down the slippery slope toward limbo. - j. poet



#### MEAT BEAT MANIFESTO

#### Actual Sounds + Voices (Nothing)

This album is the latest in an 11-year career that has seen Meat Beat Manifesto serve as a prominent influence for '90s industrial fixtures like Prodigy and Nine Inch Nails (whose frontman, Trent Reznor, heads the Nothing label). The title refers not only to Jack Dangers's well-known sonic cocktails, which sweep across genres with mind-numbing ease, but also to the album's more traditional band setup.

The live performers, including Lynn Farmer on superhuman percussion and John Wilson on "prepared guitars," propel the raw Meat Beat sound to greater heights, and a pair of Herbie Hancock's former Headhunters lend a jazz foundation that shines through. Actual Sounds + Voices catches some rhythm masters at the top of their craft. — Tamara Palmer



## FANTASTIC PLASTIC MACHINE The Fantastic Plastic

Machine (Emperor Norton)
Cutting and pasting à la Beck,
Japan's Fantastic Plastic
Machine presents a blended
brand of music that would
make any avid record collector
salivate. DJ Tomoyuki Tanaka
mixes '60s American soft rock,
Moog, French pop, and bossa
nova, then laces it with a hip
hop attitude. Groovy, baby.

Clare Kleinedler



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#### Gone Gonzo

he drubbing of the movie of Fear and Loathing in Las Vegas hasn't dimmed popular fascination with its original author, Hunter Stockton Thompson - journalist, national observer, pioneer in recreational pharmacology. One of the better fan sites, the Great Thompson Hunt, examines his history and literary output with a wide range of easily accessed links to commentary on his works. The site places Thompson's work and life in perspective, exploring his reportage of the Hell's Angels and his celebrated coverage of the 1972 presi-



In-depth Thompson.

dential campaign.

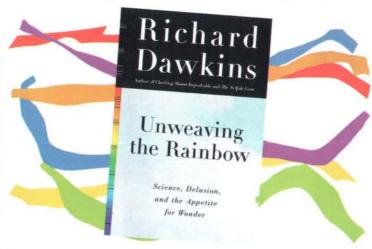
This most atypical of writers emerged from a prototypically American upbringing: birth during the Depression, a lessthan-happy childhood, a stint in the US Air Force, the process of finding his voice in the tumult of the '60s. The site offers a thorough overview, but its content is largely synthesized from other works, and it suffers from a shortage of excerpts from the books we've come to fear, loathe, and read ravenously for the past 30 years. - Michael E. Ross

The Great Thompson Hunt: www.tekknowledge.com /gonzo/.

#### Dawkins's New Medicine

The good doctor is angry. Angry with pseudoscientists, new-age Wiccans, old-age romantics, and all the illiterate relativists. The good doctor is also brightly hopeful.

The good doctor is, of course, Richard Dawkins, erstwhile evolutionary biologist and author of *The Selfish Gene*. In *Unweaving the Rainbow: Science, Delusion, and the Appetite for Wonder*, Dawkins sets out to defend the science – its method, its history, and its critical intellectual soul – from attackers on all fronts. The title is derived from John Keats, who once railed – inspired by a night of drinking with pals Charles Lamb and William Wordsworth – that science had destroyed poetry by "unweaving the rainbow" and reducing it to its prismatic colors. Not so, argues Dawkins. The rainbow is the product of millions of individual prisms, which create millions of rainbows, which we experience as we move in space. Rather than a continuum, we're seeing distinct, individual rainbows, or partial rainbows. Add to this the fact that sometimes a film inside the drops of water can create interference and alternative prismatic effects, and suddenly the rainbow becomes something far more complex – and ultimately more poetic.



#### The good doctor argues against gussying up his already wonderful world.

The spirit of his argument is not only that the complexity of the natural world as divulged by science is good and poetical, but it is precisely so because it is true – a sentiment he ironically shares with Keats. Another target of Dawkins's wrath is the increasingly ubiquitous popular-science media that purveys dumbed-down pseudoscience. For several years, Dawkins has steered the rigorous (if élite) course and maintained that science shouldn't be gussied up.

The pursuit of truth brings Dawkins to the ever hyped world of digital technology. Besides deriding postmodernists for their inability to write cogently (a problem the good doctor has never suffered from), Dawkins takes on outlandish theories about a decontextualized digital society and the heady relativity of virtual worlds. Computers, like the human brain they imitate, are irrevocably anchored in causality. Truth isn't relative in hyperspace. Each text (to borrow from the postmodernists) can be traced to its sociobiological roots. Of course, tracing such things, Dawkins writes almost gleefully, is exponentially more complex than Newton's unweaving of the rainbow – a prospect that can make even a scientist a little poetic. – *Paul Bennett* 

Unweaving the Rainbow, by Richard Dawkins: \$26. Houghton Mifflin: +1 (212) 420 5800.

#### **Put Your Noggin to Good Use**

After years of blasting mutants into so many chunks of meat, I'm finally ready to go vegetarian. H.E.D.Z. may be the key to my new diet; Hasbro Interactive's latest game neatly subverts the run-and-shoot genre so beloved by young males. Looking for that huge chaingun? You won't find it here. Dull earth tones and dank dungeons are definitely out, replaced by bright colors, wacky characters, and a sense of anarchic fun. Call it fragging for the free-spirited.

In H.E.D.Z., you're a member of an alien race whose favorite pastime is abducting humans to sever their noggins for collecting – these guys have apparently never heard of baseball cards. Head-collecting as a hobby works like this: You toss 225 heads into a big arena and race around grabbing them; each time you put on a head you



Just imagine what you can do with a new head.

gain that person's characteristics. You might find yourself as a thinly disguised Johnny Rotten clone who gobs his enemies into submission or an aircraft-carrier head who sends off tiny planes on strafing runs. Musicians, shrieking German generals, Neanderthals, New York cabbies — they're all here. Best of all, you never die; if you run out of heads, you just get beamed out of the game arena.

While Hasbro clearly wants to catch the eyes and ears of nontypical action players (read: women and children), hardcore shootists will be surprised at how fast and frenetic the play is. And there may be a larger lesson here: While we're busy working or playing, it's the aliens who end up getting a head in life. – Don St. John

H.E.D.Z.: \$39.95. Hasbro Interactive: (800) 400 1352, www hasbrointeractive.com/.



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#### The Net's Black Book

When Rolodexes held paper business cards, you could simply change a phone number with a pencil. But today's digital address books exist across PDAs, smartphones, laptops, and phone-based assistants. TrueSync.com, a free Web-based service, connects to your PalmPilot, Rex, or WinCE organizer, making sure contacts, calendars, and to-do lists are up to date. Unfortunately, phone numbers on cocktail napkins still have to be entered manually. Release: January. Motorola: www.truesync.com/.



#### 'Roid Rage

The new Asteroids may shock those who remember chasing after simple black-and-white polygons. After all, the 1979 coin-op version didn't have black holes, supernovas, or flaming comets accompanied by full-color alpha blending effects. Still, traditionalists on PCs or PlayStations can hang out in the Classic Zone and reap the benefits of a beefedup old-school 'Roids.

Release: November, Activision: +1 (310) 255 4100.

#### Browser by Worldwide Committee

Communicator 5.0 is the world's first opensource consumer product. Last April, Netscape engineers made the browser's code publicly available on the company's mozilla.org/ site. Since then, thousands of ad hoc programmers across the Net have willingly fixed bugs and added improvements to the source code. While Netscape's final version won't be released for several months, the beta is available now.

The resulting browser benefits from the group rethink. A less cluttered interface allows you to drag just about anything on or off it – meaning you can, among other things, move unused



browser buttons out of the way. You can also bring a surprising range of desktop items – your email in-box, files from a hard drive, or favorite games – to your bookmarks menu so you won't have to window-shuffle when you need them. The browser also sports fledgling support for XML, the ambitious successor to HTML. (Since few sites actually use XML, it's hard to tell whether this high-concept language will catch on.)

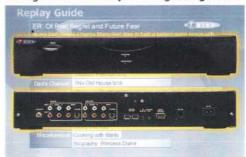
The best news is that the Net's hackers fixed Communicator's most basic barrier to adoption: certain Web pages crashing not just the browser, but also all other Netscape windows. Loyalists can now use Communicator's suite of office tools without worrying that a funky site will wipe out a crucial email message being composed in another window. – Paul Boutin and Bryan Schwab

Release: winter, Netscape Communications: www.netscape

#### **Tube Tamer**

When you'd like to catch the late show without staying up till an ungodly hour, the common VCR often fails you. Just try taping Conan O'Brien night after night: Your videotape wears out, your machine's gears begin to whine from too much rewinding, and if your favorite Irish man-child comedian gets pushed back by impeachment proceedings, you're sunk.

ReplayTV is the solution. The equivalent of a hard drive for your television, the \$995 black box digitally records up to seven hours of video and lets you jump instantly to any part of a program. You can also pause a live show any time and speed through commercials by watching footage that's



lagging just a few minutes behind real-time broadcasts. And programming it is a snap: Just type in the name of the show you want to save. The device, which downloads television schedules nightly, checks local listings for you. Company engineers claim you can even program in keyword searches – "Harvey Keitel" or "animal husbandry" – to automatically record your own custom channel.

If ReplayTV fulfills its promise, you'll be able to watch any show whenever you want. This may upset your body clock if you're attuned to the rhythms of prime time, but you need only check the moon and stars for clues on when to sleep.

Release: winter. Replay Networks: +1 (877) 737 5298, www.replaynetworks.com/.

#### **Carnival Culture**

Gone are the days of scrimping all year to make the Magic Kingdom pilgrimage: Disney Quest miniparks are bringing Mickey to your hometown.

According to John Hannigan's book Fantasy City: Pleasure and Profit in the Postmodern Metropolis, such Baudrillardian simulated reality is part of a much broader trend in which our public space increasingly resembles a theme park.

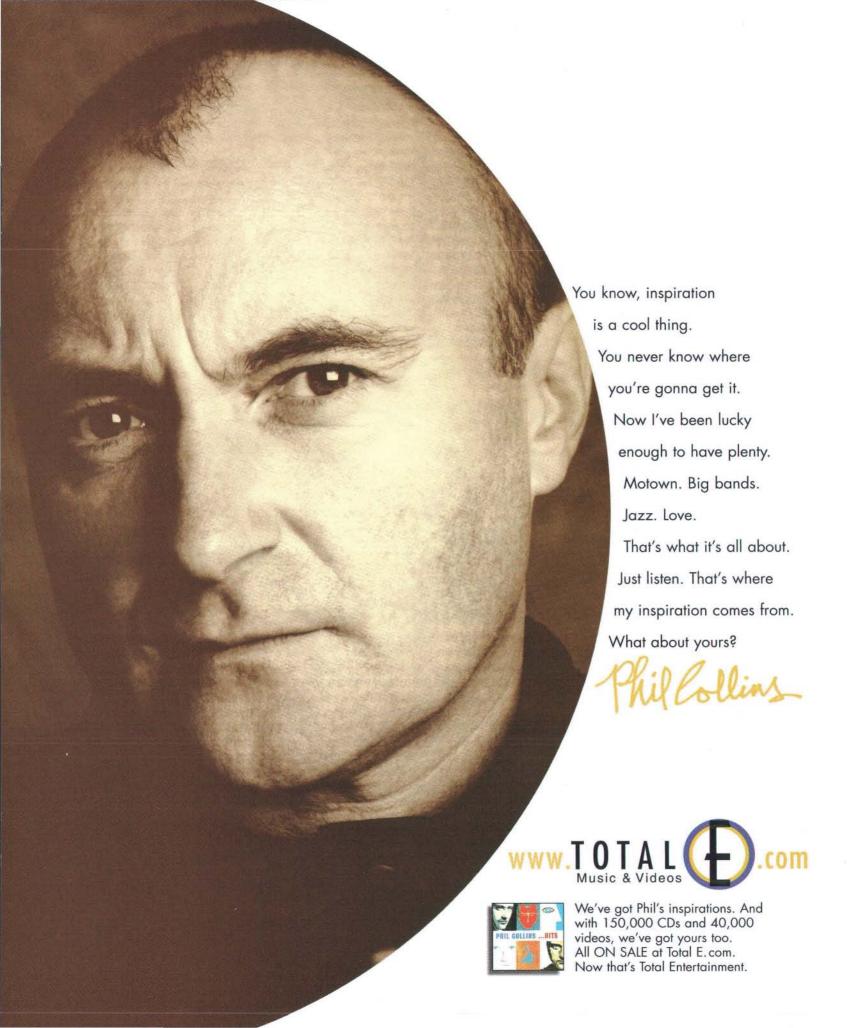
Release: November. Routledge: www.routledge.com/.

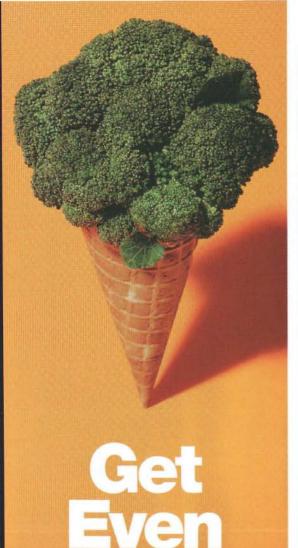


#### Lights, Camera, Action

A picture may be worth a thousand words, but sometimes you need a minimovie to get your point across. Sony's MVC-FD91 Digital Mavica camera uses plain old floppy disks to store images, but the \$1,099 device also shoots 60-second videos, complete with sound, that you can email to a friend. The standard MPEG files can be opened easily by anybody, from Grandma to the folks back at HQ.

Release: fall. Sony: www .sony.com/mavica/.





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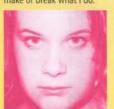
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### README

ON THE BOOKSHELVES OF THE DIGERATI

**MAGGIE WHORF, 16** cartoonist, author of Bohos The Feminine Mystique, by Betty Friedan. "I read this book because it's a cultural reference and I wanted to be informed It was written in 1963, and the writer was like, 'Women need to evolve.' I've noticed that things have changed. Women are more accepted as working entities. It makes me empowered. I didn't look at myself as a female, just as a person. This has made me more aware that I'm a female and it's not something that should make or break what I do."





**SHAHID MINAPARA, 11** toy designer, Wild Planet The Illustrated Directory of Modern American Weapons, edited by Ray Bonds. "My career is aviation. I like fighter jets. I read lots of books on biplanes and sea planes; how you fly them, how to turn it without flipping over, and how to do emergency landings - like how you can land in water with the propellers not working and stuff. I thought of trying a few training camps where they teach you to fly smaller planes, but you have to be 14 to go, so I'm waiting."

## GREGORY MILLER, 14 president, Tenadar Software Starship Troopers, by Rebert Heinlein """

Robert Heinlein. "I'm a big sci-fi fan. It gives me good ideas for my games. The way we do spaceships, and the way they move, we got from Star Wars books. We didn't use the same thing, but we used the same idea. In this story, this kid just graduated from college and he wants to join the Marines. As they go through all the training, the book kind of makes fun of the recruiting system. Then the main character goes to war against bugs."





**CHRISTY BOND, 14** kid tester, Purple Moon Saddle Club series, by Bonnie Bryant. "This is a series of books about three girls who love horses, so they have this club and they ride together. I like them because they're easy to read. Even though I'm a pretty good reader, I don't get into literature. I think it's good. But it's not as fun to me. I like the real light stories. And I love horses a lot. I've been riding for four and a half years. I only have a lesson once a week. But last summer I leased a horse for a month, so I went out every day."

- Julie Sullivan

## A

#### City of Bits

f you're a mediaholic like me, you'll get a kick out of the Gas Book CD-ROM. Now, don't raise an eyebrow or shake your head – even though the concept of the CD-ROM magazine is somewhat passé in the context of both popular, accessible ezines and enduring print periodicals.

The CD-ROM, however, is the perfect medium for the lively content, playful tone, and energetic style of Gas Book, a showcase for some of the world's freshest multimedia and techno music talents. The most recent edition, called "Gas City," revolves around the idea of an imaginary city in which individual boroughs are designed by contributing artists. Instead of merely scrolling through pixelated text and scanned-in images, you navigate through various animated land-scapes that serve as an international pastiche of sensory interpretations of city life. The spectrum



Gas Book: new media metropolis with a touch of techno.

of work ranges from a deliberately maddening sound and image loop by the New York digital artist Day-Dream to imaginative symbols and collages created by Japanese font designer yo-yo Suzuki and the boogie-friendly drum grooves of Swedish band Sluta Leta.

The experience of Gas Book is a hybrid of flipping through the glossiest fashion rag and watching a hipper version of MTV – presented in the global language of slick aesthetics and butt-shaking rhythms. No, it ain't Tolstoy, but this multimedia diversion – which comes with logo decals, an audio-only music CD, a T-shirt, and a Japanese/English book of artist bios – is certainly frothy. – Reena Jana

Gas Book: ¥4,500 (US\$34). A & P Coordinator Japan Co.: +81 (3) 5454 0920, fax +81 (3) 5454 0921.

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#### **Return of the Giants**

he first animated feature lauded by the Cannes Film Festival, Fantastic Planet has for many years been available only in washed-out and choppily edited bootleg prints. At last, an uncut print of René Laloux's 1973 masterpiece is rolling into theaters — Just in time for its 25th anniversary.

On a distant planet in an unknown time, humans live in fear of the Draags, a blue-skinned, red-eyed race standing 40 feet tall. When a Draag child casually kills a human mother with the flick of a finger, she makes amends by



When life is a Draag. adopting the dead woman's child as a pet. However, the new pet quickly taps into the secret of Draag brainpower and escapes to share her knowledge with a band of humans. Together, they bring down the reign of the Draags.

Fantastic Planet puts contemporary animation to shame. Don't expect cartoon cutesy here: The focus is closer to Dali than Disney, with a touch of Che Guevara thrown in. — Phil Hall

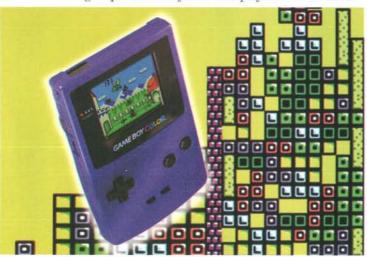
Fantastic Planet: in theaters this winter. Cinnequanon Pictures: +1 (213) 658 6043.

#### **Game Boy Color**

had looked everywhere: Toys 'R' Us, Target, Electronics Boutique – even ePay. Every online retailer, every mail-order company, every brick-and-mortar toy chain in the entire Bay Area. Truth was, there wasn't a single Limited Edition Ice Blue Game Boy left in the universe, and I was profoundly bummed.

Little did I know that I was mere weeks away from the coolest and most anticipated Game Boy launch since its début in 1989 – the Game Boy Color. Now, this is not to be confused with all the stylish colored casings that have been introduced in recent memory. This is the first Game Boy to generate brilliant full-color onscreen graphics. Even older games like *Donkey Kong, Super Mario*, and *Tetris* can be played in color. My imagination goes berserker just thinking about the possibility of tiny portable pink Kirbys. The fact that the system is as compact as the Game Boy Pocket and ships with a bright purple outer shell makes it all the more fantastic.

Talk of a color Game Boy had circulated among the rec.games .video.nintendo gossiphounds for years. "Our players have asked for



The wonderful world of Nintendo - in its full-color glory.

a Game Boy that could play their favorite games in color. But the technology and the high demand on battery life made it impossible," says Nintendo of America chair Howard Lincoln. "As the first to surmount the technical obstacles, we're able to introduce a new generation of color games to the millions of people who love Game Boy."

To put that in context, although the Game Boy Color is not the first of its kind – that title goes to the now retired Atari Lynx – it is no doubt the most visually stunning and technologically advanced. With the ability to display up to 56 colors simultaneously from a palette of more than 32,000 (Lynx could display only 16 of 4,096) on its reflective screen, battery life of more than 10 hours on two AAAs, complete compatibility with the entire library of Game Boy's existing titles (all colorized!), and new color games developed especially for this system, that's one hell of a development curve – and well worth the month-long waiting list. You bet I was on it. Now all I need is a Limited Edition Safety Orange number. – *Van Burnham* 

Game Boy Color: \$79.95. Nintendo: www.nintendo.com/gb/.

#### Contributors

Mark Athitakis (mathitak@sirius.com) regularly covers music and other pop culture obsessions for Salon, SF Weekly, and others.

Paul Bennett (sadie@el.net) haunts Manhattan's Lower East Side and arranges words for sundry periodicals.

**Colin Berry** (colin@wired.com) is a Wired contributing editor who drinks espresso and writes as-yet-unpublished short stories in San Francisco.

**Paul Boutin** is HotBot's search-technology manager and an occasional guest expert on CBS's *Up to the Minute*.

Van Burnham (van@wired.com) is a videogame junkie and a designer at Wired Digital. She can kick your ass at Galaga.

Craig E. Engler is the editor of Science Fiction Weekly and an online consultant for the Sci-Fi Channel's Dominion Web site.

Mark Frauenfelder (mark@well.com) is editor of bOING bOING, a zine for fans of Harold von Braunhut.

Michael Grebb is a Washington, DC-based writer focused on technology, Internet, and telecom issues.

Phil Hall is an okapi at the Bronx Zoo.

Reena Jana (reena@sirius.com) contributes to The New York Times Magazine, Flash Art, and Artforum. She needs constant visual stimulation.

**Beth Johnson** is a senior reporter at *Entertainment Weekly.* 

Jon Kaufthal (kaufthal@ibm.net) freelances out of New York and Philadelphia.

Clare Kleinedler, a contributing editor for Addicted to Noise, freelances for BAM magazine, the San Francisco Chronicle, and the Marin Independent Journal.

Hari Kunzru (hari@dircon.co.uk) is probably wandering around London's Soho looking for new brands of bottled beer.

**Alanna Nash** is working on a book about Colonel Tom Parker.

Tamara Palmer (trance@netcom.com) is coeditor of URB.

**Charles Platt** (*cp@panix.com*) writes science fiction books and science articles.

j. poet (poebeat@earthlink.net) is older than rock and roll but younger than your parents.

Michael E. Ross (rossculcha@aol.com) reviews books and music for Vibe and Newsday. He's hard at work on a novel.

**Don St. John** (dgstjohn@concentric.net), former features editor at *PC Games*, is a freelance games and technology writer.

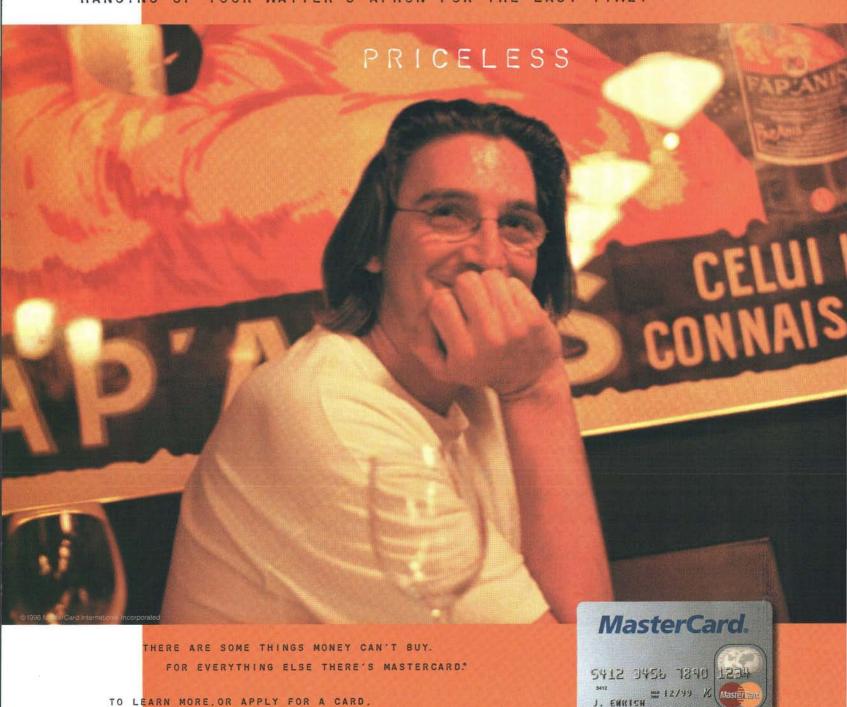
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#### **Force-Feedback Wheels**

First Class:

#### Virtual Vehicle TDi

Interactive I/O's ride is so realistic and its mechanism so powerful that gamers actually break a sweat fighting the steering wheel around tight corners. Its tactile feedback allows racing pros (and other sim enthusiasts) to accurately feel g-forces and post faster times on virtual tracks. The handmade metal game wheel, with standard pedals and gear shifters, puts you as close to the pole position as you'll get with a plastic gaming peripheral.

Virtual Vehicle TDi: starts at \$695. Interactive I/O: +1 (714) 921 0994, www.interactiveio.com/.

#### **Business Class:**

#### WingMan Formula Force

Many force-feedback wheels use gears to drive the tactile effects, creating an unrealistic mechanical feel for the gamer. But Logitech puts high-fidelity steel cables between the internal mechanism and the wheel, allowing players to better feel the bumps of train tracks or the sudden slackness of a patch of ice.

WingMan Formula Force: \$179. Logitech: +1 (702) 269 3457, www.logitech.com/.

#### Coach:

#### Force RS

Pick up ACT's new Force RS system and a copy of Microsoft's Monster Truck Madness II, and those back-country roads will seem so realistic you'll think you've got hay between your teeth. This steering setup delivers refined effects, carries Formula 1-style gear shifters, and generally looks the best of all PC drive-sim wheels.

Force RS: \$139.99. ACT Labs: +1 (604) 278 3650, www.actlab.com/.



#### **Digital Video Cameras**

First Class:

#### DCR-TRV900

The TRV 900 has three image-sensor chips, meaning you get brighter colors, improved resolution, and more clarity. With the progressive scan mode you can pull out any video frame as a still photograph. The camera also boasts a 12X optical zoom, and it's ready to take advantage of your computer's editing power with a smashingly geeky PC card slot and floppy-disk adapter.

DCR-TRV900: \$2,699. Sony Electronics: (800) 222 7669, www.sony.com/.

#### Business Class:

#### - Vistura

Small cameras tend to shake more in your hand, but not this bantam beauty: Canon's lens-shifting stabilization cancels any unwanted cinéma vérité effects. With a 16X optical and 64X digital zoom, the lens compensates for abrupt angle changes by redirecting light before it reaches the image sensor. Vistura also has a shape that naturally fits your hand.

Vistura: \$1,999. Canon: (800) 652 2666, www.canondv .com/.

#### Coach:

#### GR-DV3

The GR-DV3 is the tiniest digital video camera you'll find at any price. The shiny, brushed aluminum number weighs less than a pound and has an impressive 100X digital zoom. Though it has a plain old view-finder instead of an LCD, the camera does a good job of digitally improving the image for close-ups of distant objects. And of course it has a firewire port, letting you edit footage on your computer.

GR-DV3: \$1,599.95. JVC: (800) 252 5722, www .jvc-america.com/.

#### **Rolling Carry-on Luggage**

First Class

#### Wheel-A-Way 22" Carry-On Suiter

Tumi's highflier is an elegant and practically indestructible piece of luggage. With a layer of tough "ballistic nylon" or dreamy leather over a fiberglass frame, this bag was born to protect those fragile expense-account indulgences. Smooth thermoplasticelastomer pop-up handles, recessed wheels, and a zip-out suit compartment dress it up nicely.

Wheel-A-Way 22" Carry-On Suiter: \$495. Tumi: +1 (732) 271 9500, www.tumi.com/.

#### Business Class:

#### Platinum 22" Rollaboard

Travelpro's founder, an airline pilot with 25 years' experience, invented the archetypal crew member's carry-on, and the Platinum series stands out like no other airport baggage. Generous handles, a secure ticket pouch, a large rear pocket, and a snap-in wetpack (for après that last-minute dip in the pool) combine to make this a most welcome stowaway.

Platinum 22" Rollaboard: \$375. Travelpro: +1 (561) 998 2824, www.travelpro.com/.

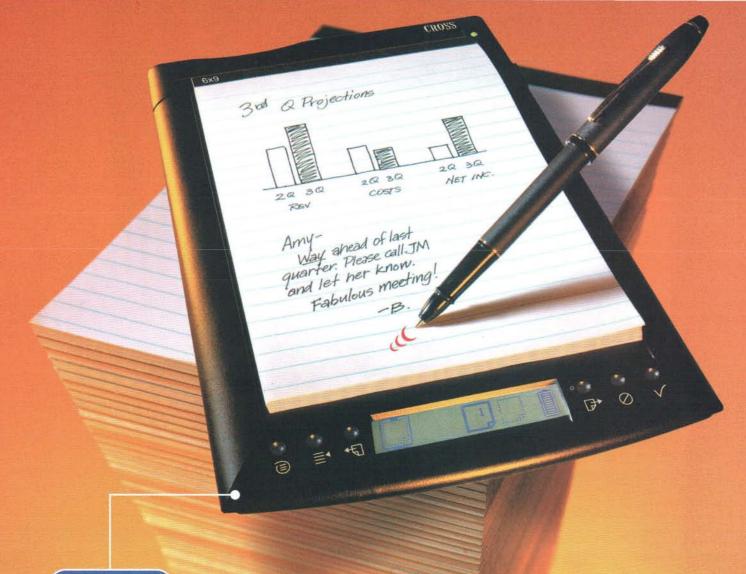
#### Coach:

#### **RBH Sport 22" Wheelaboard**

Ricardo's luggage might not be the priciest around, but no one will ever guess as you roll it toward the gate. Besides the high-ticket-item styling, expandable main compartment, and handy interior mesh shoe pockets, this gear box packs a clever bottom-stabilizer bar, eliminating the tippiness that so bedevils many bags. Now boarding!

RBH Sport 22" Wheelaboard: \$160. Ricardo Beverly Hills:





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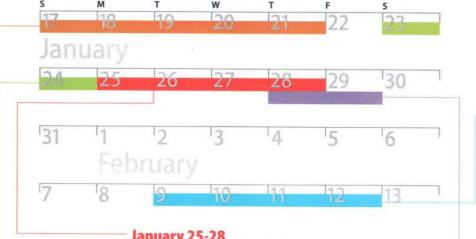
Meetings of the minds. By Catharine Lo



In 1991, 100 eager code slingers gathered for the first RSA Data Security Conference."We thought we were the bomb to have so many people interested in crypto show up," laughs director Kurt Stammberger. This year, attendance is expected to exceed 5,000, a testament to the growing interest in encryption, particularly for ecommerce. "It's a very funky mix of Ferragamos and Birkenstocks, but it's fun," Stammberger says. Between speeches by PBS's James Burke and Intel's Patrick Gelsinger, conferencegoers can pay their respects to the famed code-cracking supercomputer Deep Crack or cut loose at the IBM Cryptographers' Gala, hailed as one of the computer industry's last great parties.

Tête-à-Tête Potential \*\*
Geek Factor \*\*
Idea Takeaway \*\*
Star Power \*\*\*

Registration: \$1,595. Contact: (888) 806 1545, fax +1 (513) 733 1302, www.rsa.com/conf99/.



#### January 23-24 International Symposium of Science, Technics, and Aesthetics Lucerne, Switzerland

The theme "Frontier Communication: Human Beings, Apes, Whales, Electronic Networks" sounds like the Sesame Street game "one of these things is not like the others," but by the time you leave this conference, you'll understand the connection. Artists and scientists convene to discuss how new links between communication and behavior confront basic principles of existence. Don your metaphysical thinking cap for "The Global Brain as a Modeling Paradigm for Crisis" and Margot Lovejoy's "Transaesthetics." If those topics sound too New Age for you, try "Bonobo - the Forgotten Ape" or "Why Do Whales Sing?"

Registration: SwF80 (US\$57) per day. Contact: +41 (41) 370 3818, www.parterre.ch/neugalu/.

## January 25-28 1999 National Association of Television Programming Executives Conference New Orleans

How do TV execs decide what to air for the next fall season? They go to NATPE's conference, an annual content bonanza for more than 17,000 broadcasters, cable representatives, advertisers, and studio bigwigs from all over the world. "Every show that is seen in another country but isn't developed there is bought and sold through partnerships created at NATPE," explains Beth Braen, vice president of creative services. Programming deals - for everything from Donny and Marie's new talk show to reruns of The Simpsons in Spain – are brokered on the exhibition floor. Practical sessions like "Stick or Click" cover the impact of media convergence and industry regulation, but celebrity interviews by Larry King and a keynote by Howard Stern promise to be the real treats.

Tête-à-Tête Potential ★★★
Geek Factor ★
Idea Takeaway ★★
Star Power ★★

Registration: \$400. Contact: +1 (310) 453 4440, fax +1 (310) 453 5258, www.natpe.org/conference/.

#### January 28-29 1999 Measurement Science Conference Anaheim, California

Back in the 1870s, no matter where you were, noon was when the sun was at its zenith. The need for standardized time zones became apparent only when transcontinental railroad operators were unable to tell passengers what time they'd arrive. Such legacies aren't taken for granted by the engineers and technicians who meet at the Measurement Science Conference, which began as "a group of people who knew how to measure very difficult things and could tell others how to do it," according to spokesperson John Schulz. Experts assess different calibrations, from pressure gauges to flowmeters, so we can all rest assured that if we give an inch, they won't take a mile.

Tête-à-Tête Potential \*\*

Geek Factor \*\*

Idea Takeaway \*\*

Star Power \*\*

Registration: \$235-350. Contact: +1 (714) 847 7380, fax +1 (714) 672 9321, www.msc-conf.com/.

#### February 9-12 Milia '99 Cannes, France

With a little genius and a big idea, 30 lucky contestants will receive a coveted invitation to Cannes. There, they will have the chance to showcase their homegrown interactive software projects before the 7,000-plus media professionals at Milia, the acclaimed International Content Market for Interactive Media convention, Industry scouts from big gaming and entertainment companies like Disney and Infogames match aspiring developers with hungry content seekers. In response to the popularity of online and interactive gaming, Milia launches a concurrent spinoff this year - Milia Games, Organizing the play will be Peter Molyneux, creator of the groundbreaking God-sim game Populous and founder of Lionhead Studios.

Registration: f4,764 (US\$794). Contact: +1 (212) 689 4220, fax +1 (212) 689 4348, www .milia.com/.

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If this seems a little pricey, the Internet can provide much of the same information - in real time - for a lot less. Complete services like PC Quote and DBC feature equities and options charting, analytics, and quotes for \$75 to \$300 a month. Or if that's still too rich for your blood, try the guerrilla approach: Create your own Bloomberg desktop using Web browser windows and streaming media. Then, use the cash you save to pick up a few stocks on your wish list, and watch them plunge - in real time. - Dave Katz

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#### Sports Scores

Up-to-the-minute game results can be found on CBS SportsLine (www .sportsline.com/u/sportsticker/scoreboard/) and displayed as a component on your desktop.

Avid traders should use money management software, such as Microsoft Money or Quicken, to keep tabs on their taxes

#### Use the BigCharts site (www.bigcharts.com/) for sophisticated graphing; it also lets you save your



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charges just \$7.95 per

trade.

Bullsession.com's ticker (www.bullsession.com/) tracks your portfolio and US exchanges in real time for \$36.95 a month.

#### Stock Ideas

#### It's a Wireless World

Globalization, once a mantra, is now a curse for companies tied to overseas economies. For wireless service providers, however, a presence in worldwide markets is still a strong selling point. Unlike their industrial or commodity-based counterparts, wireless ventures are not subject to seasonal trends or the effects of severe weather. More important, cellular is often and rightly viewed as a cheap alternative to wireline service in countries with an underdeveloped or overtaxed telecommunications infrastructure.

Among the higher-rated wireless outfits, San Francisco-based AirTouch Communications is favored precisely because of its global presence. AirTouch, with over 32 million customers around the globe, is now the world's largest wireless communications provider. And it plans to add 3 million new cellular and PCS customers by the end of the year. "It has been a great stock for a year and a half in terms of growth and performance," says Colette Fleming, a telecom analyst at Morgan Stanley Dean Witter. "And it's been fueled by the company's international growth."

Also worth paying attention to is Nextel Communications, whose strength lies in an established domestic customer base and a growing presence in Latin America and Asia. Nextel is still in a nascent phase of international expansion, with over 2 million domestic and 300,000 global subscribers. Analysts anticipate it will have a positive cash flow before next year. "If the market snaps back, Nextel is going to have a turbocharged rate of return," predicts a well-known market player.

Wireless firms are seeing dramatic growth even in regions around the globe that have been pummeled by recent economic events. "Demand is so high and the demand curves for wireless are so incredibly steep," explains Doug Colandrea, a telecom credit analyst at Morgan Stanley Dean Witter. "Wireless companies don't feel the impact from negative economic news that you might expect." - Heather Bourbeau

AirTouch: www.airtouch.com/. Nextel: www .nextel.com/.

### NEW MONEY

"If they show their faces on Wall Street again ... you'll have to restrain two-thirds of the people who work there from killing them."

 James J. Cramer in TheStreet.com, on the principals at Long Term Capital Management

#### Funds

#### **Hungary for Action?**

What's next for a formerly communist-led country with 45 McDonald's, a male cabinet minister who sports an earring, and an annual week-long rock extravaganza called Pepsi Island? A technology stock fund, of course. That, at least, is the way the Budapest-based Central European investment firm Rona & Társai sees it.

Rona's First Hungary Fund has thrived due to the country's emergence as Central Europe's leading economy. Starting with an initial investment of \$80 million in 1990, it has grown to \$211 million, with \$28 million in dividends. Rona's new Hungary Venture Fund will focus on tech start-ups throughout Central Europe, with an emphasis on Hungarian outfits. The firm hopes to raise \$100 million to start the fund, which is due to begin operating at the end of this year.

"Coloryte would serve as a good example of the kind of companies we are investing in," says Peter Rona, president and CEO of Rona & Társai. Budapest-based Coloryte develops systems designed to diagnose and correct color-vision deficiencies. The success of other Hungarian tech ventures, such as Recognita (scanning software) and Graphisoft (architectural programs), bolsters Rona's belief that Central Europe is a fertile breeding ground for new technologies.

But while Hungary has been enjoying a prosperous period, several risks remain. Currency fluctuation, a perplexing legal system, and possible restrictions on foreign investment present considerable uncertainties. When a center-right party defeated the governing Socialists in May, the Budapest Stock Exchange fell 20 percent. The market made a quick recovery, but has suffered again during the economic crisis in Russia. Such drops are to be expected in an emerging market economy – luckily, so is growth.

– Sam Margolis

Rona & Társai: budapest@rona.hu.

#### The Wired Investment Portfolio

#### **Cashing in the Chips**

Our larger cap strategy led to a decent if unspectacular gain for the month, with the portfolio advancing a modest 4.37 percent, which easily outpaced the Russell 2000's .56 percent gain. But the fall's seasonal tax-loss selling should put added pressure on depressed stocks, so I'm avoiding the ever growing list of stocks selling at cash and book values. On the other hand, they're getting mighty tempting.

First, a little bookkeeping: Cisco split three for two, so we upped our holding by 1,500 shares.

Next, it's time to turn in our chips: I'm selling Power Integrations and Intel. We're up big on both, and I'll look to repurchase Power below 10 and Intel in the low 70s. Nowadays, I feel more comfortable owning telecom, Net, and enterprise software stocks because they're more recession-resistant than PC-related companies.

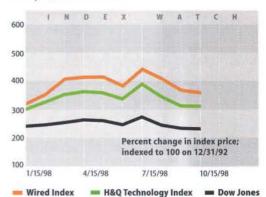
Thus, I'm buying Lucent Technologies. Currently trading at 66 ½, Lucent has corrected almost 40 percent off its high of 108 ½. And it should rebound nicely in a healthier market. I also like Lucent's large investor base – due to the millions of investors who received the stock (and tucked it away) during the AT&T spin-off.

SAP competitor PeopleSoft got new built-in demand from its addition to the S&P 500. All S&P 500 index tracking portfolios are now obligated to own the company, so I'll pick up some despite the controversy over whether growth in the ERP sector is slowing. In this market, any kind of built-in demand can't hurt. – *Jeffery Wardell* (jwardell@hamquist.com)

#### The Wired Index

#### The Right Stuff

Globalstar Telecommunications lost a dozen satellites and nearly half of its market value when a rocket launch failed in September. Investors cautiously returned after the company said the 48-satellite system would be delayed, not derailed.



In other Index news: MCI WorldCom won final approval for its \$40 billion merger, as did Daimler-Benz and Chrysler ... Qwest Communications plunked down \$185 million in stock for Icon CMT, allowing the fiber-optic carrier to offer Internet services for businesses ... Yahoo!'s value advanced after inking a deal with AT&T for a cobranded online service ... Dell Computer also climbed into the sack with AT&T (along with Excite and SBC Communications) for its own all-in-one package. Synergy lives.

#### - David Lazarus

The Wired Index tracks 40 public companies selected by editors of Wired to serve as a bellwether for the new economy. For a complete description and the latest results, see stocks wired.com/. The Wired Index is not a traded fund or portfolio. Some of the companies in the Wired Index may have an advertising relationship with Wired. Readers who use this information for investment-related decisions do so at their own risk.

Compa	iny	Primary Business	Symbol	Shares	Last Trade 10/1	Current Value	△ Since Purchase
HOLD	ING						
Advanced Fibre		Telecom equip	AFCI	15,000	65/16	\$ 94,688	+ 5%
America Online		Online services	AOL	3,000	100	300,000	- 2%
BioChem Pharma		Pharmaceuticals	BCHE	8,000	18	144,000	- 15%
Cisco Systems		Network hw/sw	CSCO	4,500	571/4	257,625	+ 42%
Microsoft		Software	MSFT	2,000	104 ½s	208,125	+ 24%
MMC Networks		Microchips	MMCN	7,500	15	112,500	- 38%
Pfizer		Pharmaceuticals	PFE	1,500	99 %	149,438	+ 1%
Qwest		Telecom service	QWST	3,000	32 1/16	97,688	- 17%
SAP		Enterprise software	SAP	2,500	35 %	89,688	- 28%
SELL	ING				_		
Power Integrations		Microchips	POWI	10,000	131/16	130,625	+ 54%
Intel		Microchips	INTC	3,000	83 1/16	250,313	+ 82%
BUYI	NG						
PeopleSoft		Enterprise software	PSFT	4,000	321/2	130,000	
Lucent Technologies		Telecom equip	LU	2,000	66 1/8	132,250	
Cash	\$331,250	Portfolio Value 10/1		2,047,252		1 5 1 L 155	STATE OF THE REAL PROPERTY.
		Portfolio Value 9/1		\$1,961,188			
		One-Month Portfolio Per	rformance	+ 4.39%	Russell 2	2000 Index	+.56%

Legend: This fund started with \$1 million on December 1,1994. Profits and losses are reflected monthly, with profits reinvested in the fund or in new stocks.

The Wired Investment Portfolio (formerly TWITS) is a model established by Wired, not an officially traded portfolio. Jeffery Wardell is a senior vice president executive financial services representative for Hambrecht & Quist LLC and may have a personal interest in stocks listed in the WIP. The opinions expressed herein are those of the author and not necessarily those of H&O's research department. H&O has not verified the information contained in this article and does not make any representations to its accuracy and completeness. Wired readers who use this information for investment decisions do so at their own risk.

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■ 202 small computing devices – phone/computers like the Nokia 9000 Communicator. Ericsson, which liked WinCE enough to choose it for its PDA, picked Symbian's EPOC OS for its smart phones. One reason: WinCE isn't optimized for low power consumption. Another: Manufacturers are reluctant to get in bed with Goliath.

Set-Top Freeze-Out. The fractious cable industry is united on two points: the need for open standards in new digital set-top devices, and a reluctance to give Microsoft too big a piece of that action. Case in point: TCl's early '98 deal to let Microsoft supply only 5 million WinCE-equipped set-top boxes; but much of the business will go elsewhere – chiefly to Sun and Sony.

Y2K Diversion. Much of the treasure that corporations will spend bugproofing themselves will be money not spent on Microsoft wares. Laments one analyst: "They are diverting IT resources, not just from projects like NT, but from the 'Why do I need the next Office upgrade?' department."

you've sold, the bigger your potential liability when things go awry. It is certain the Year 2000 will go awry to some degree. Who'll be in the tort lawyers' sights? "Large companies who have deep pockets," says Microsoft CFO Maffei.

**Global Flu.** Getting more than half your revenue outside the United States sounds like a great idea – until the rest of the world's currencies start crashing. As Maffei says, "There is nothing we can do to stop it."

Software Freehooters. The world's emerging markets are vast, but software pirates have torched a lot of the profit potential. Look at what the buccaneers have done in China despite an aggressive effort to shut them down: The country's PC market is a bit bigger than France's, but Microsoft's sales in China are less than a tenth of those in France.

**Skimmed Milk.** Because Microsoft doesn't own the Net, it's forced to work in open standards like TCP/IP, HTML, and XML. The upshot: It's harder to create any kind of proprietary system, and harder

"Microsoft dodged a bullet with the Internet. But a lot of people inside the company wonder if Bill can do it again – either because he won't see what's coming, or because this time the company won't be able to turn in time."

- Microsoft product manager

### Memo to Microsoft: 10 Tips for the Era Ahead

- Preempt the antitrust crusade. Break up the company now, on your own terms.
- Spin off Windows as a separate company. Put the OS into the public domain. Sell support and service.
- Turn NT into a corporate/enterprise service firm. Make this the last upgrade ever.
- Create distributed network software that's better than Jini and Java.
- Get connected: Move software headquarters to Silicon Valley.
- 6. Learn to play politics.
- Exploit what goodwill there is left. Give the Microsoft brand some real meaning for the consumer.
- Strip the geeks out of the media/interactive group and pack up the bunch to LA or NY.
- Send Gates up the mountain to find a business model that works for commercial software, because all OS software will be free in the future.
- Start the Microsoft Charitable Foundation with an initial endowment of \$25 billion – while you still have it.

to keep existing proprietary systems going. That's a problem for a company fed on the rich cream of Windows.

That Insecure Feeling. Microsoft has yet to show itself prepared for the security challenges of the Network Era. As legions of crackers have gleefully demonstrated, the MS habit of constantly integrating new features into its operating system is inherently insecure.

That Other Insecure Feeling. Some federal officials say they're wary of having too much critical infrastructure dependent on a single company's minimally secure products. A ban on Microsoft software for critical uses isn't practical. But hardliners have suggested the government avoid depending on Microsoft if possible.

of building a service army to make its products work for corporate users. It outsourced that chore to value-added resellers and systems integrators. But as enterprise software gets more customized and job specific, value is shifting closer and closer to the client. That leaves Redmond's strategists with the unhappy choice of screwing loyal distributors or letting them pocket cash that would otherwise help its bottom line.

Bill's Billions. Accumulating a \$50 billion fortune, even one that exists mostly on paper, puts a human face on greed. So does building a \$60 million pleasure dome (which shows off a host of ultratycoon features, such as a 20-car garage, and flaunts dazzling touches of personal wealth, such as the 16th-century Leonardo da Vinci Codex Leicester). The result: Microsoft bears the brunt of any hard feelings people harbor for America's richest man.

Muddle Age. What does it mean when your chief technology officer, Nathan Myhrvold, has enough time on his hands to spend 16 months researching the purchase of his own Gulfstream III jet? And follows up by writing an anonymous account for Vanity Fair and trading in the dreamcraft for a \$38 million Gulfstream V? A Wall Street Journal reporter wanted to ask, but Myhrvold was off fly-fishing in Mongolia.



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program—designed to give babies and infants the best developmental start. Now, as a second grader, Zach continues to work with an Easter Seals physical therapist to gain the greatest amount of independence possible. Now it seems everything's within reach.

### NBC

◄ 207 year - a figure that could double by next year, say analysts. Even before this summer's investments in Snap, Intertainer (an ondemand video entertainment and shopping service), and Gemstar (the developer of interactive programming guide services), NBC · was driving furiously onto the Net, acquiring stakes in chat, entertainment, music, travel, retail, and data-mining services and sites.

The result: metamorphosis. Today, more than a dozen networks – analog and digital; in Europe, Asia, and North America; on broadcast, cable, and the Web – carry the initials of the now-anachronistic National Broadcasting Company.

"NBC has the best convergence strategy of all the major networks," Ira Carlin, worldwide media director of the McCann-Erickson advertising agency, says. "They've been much more forthright in articulating that, through convergence, they will be able to put together multiple distribution channels for content as

study in the management of technological uncertainty. Bob Wright and his crew know that convergence is a game of political intrigue, financial scheming, and industrial brinksmanship – a game at which they have repeatedly outmaneuvered their competition.

Alternative distribution weighed heavily on Wright's mind from the moment he ported over to 30 Rock from the GE campus in Fairfield, Connecticut, 12 years ago. A 43-year-old lawyer who'd been running GE's finance division, he was a pure product of a General Electric culture that demanded rational analysis. That analysis said the networks' audience was evaporating and it was time to find new ways to connect.

There were two problems, though. First, GE and its investors were religious in their devotion to ever improving earnings, not merely increasing cash flow. That limited the amount Wright could spend experimenting. Second was GE chair John F. Welch Jr.'s

### Re-create us, Wright told his new hire Rogers, but do it cheaply.

well as multifaceted forms of content. Other than ABC, which had a head start with ESPN, it's the only broadcaster to go successfully down the cable path. They have a unique relationship with Microsoft. And their people are the tops."

But for how long? Disney, the parent of archrival ABC, has raised the stakes in the convergence game, anteing up big bucks to buy content developer Starwave and a stake in Infoseek, and launching a powerful consumer portal brand in Go.com. NBC, forced by the relative penuriousness of its parent company to rely on a strategy of small bets, risks watching advertising and transaction dollars migrate to such freer spenders. As Peter Neupert, the former Microsoft executive who negotiated the MSNBC deal, asks skeptically, "Are they building value in ways that can win?"

Based on NBC's decade-plus fighting the convergence wars, the answer remains a guarded yes. For NBC's convergence strategy is not about technology. Rather, it is a case distaste for new media. "Jack is not a particular fan of this area of activity," Wright allows, "because he's very skeptical of the models and of the unproven nature of a cash return on many of these investments." NBC's metamorphosis strategy would be strictly pay-as-you-go.

Wright gave this difficult and even contradictory battle plan – re-create us, but do it cheaply – to his first major executive hire, a young lawyer from Washington named Thomas S. Rogers, who shortly after joining NBC formed the new cable division. A chronic dealmaker, Rogers, then 33, had already helped deregulate the cable industry, as senior counsel on the House Telecommunications, Consumer Protection, and Finance Subcommittee.

His single-mindedness in driving the company into a competing medium won him few friends. NBC – the first radio network, the first television network, the first to broadcast "in living color," established, tweedy, proud – was resting comfortably in first place. The

last thing anyone wanted to hear about was change. Rogers became known as an abrasive character, "needlessly querulous" in the words of one top cable executive. He was also among the earliest prophets of convergence – a concept he was patiently explaining long before the term entered the parlance.

Even as recently as 1987, cable was not a sure bet. Fortunes had been lost; although afterthoughts like ESPN were growing into multibillion-dollar assets, no one seemed able to predict a hit. Regulatory and technological issues clouded the landscape. How much control would municipalities exert over cable providers? Would the government allow cable-broadcast cross-ownership? Many mainstream media companies – notably CBS – were paralyzed by doubt.

Wright and Rogers knew they had to forge ahead, but into what, exactly? News was the one product they believed they could repurpose. "When you own news," Rogers notes, "its ability to be massaged and played out across all these platforms is far greater than sports or entertainment, where by definition you are dealing with a rights owner."

Equally important, some form of news was less likely to alienate the affiliates. For large entertainment companies, broadcast affiliates and cable operators are the Scylla and Charybdis of convergence. The affiliates see cable as a threat; anger them by going up with directly competitive programming, and they could abandon your broadcast network for syndicated shows or another network. And the cable operators have traditionally hated the broadcasters, who fought unsuccessfully to halt the spread of cable; irritate them further, and they may refuse carriage to your new network. The trick was to find programming impressive enough to compel cable carriage without antagonizing the affiliates. For NBC, that meant not just news - the basis of Ted Turner's CNN, a darling of the cablers - but business news.

In April 1989, NBC went up with the Consumer News and Business Channel. It was low-rent (faceless financial news by day) and low-class (talk, especially sex talk, by night). Yet underlying the new network was a business model that proved a big winner: It was financed largely by direct-response advertising, theretofore used primarily for cheap come-ons by magazines and 258 ▶

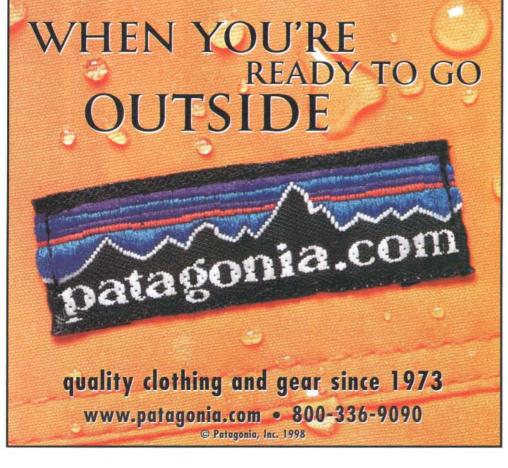
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### NBC

◄ 256 record companies. Financial advertisers like Fidelity and Morningstar later expanded their advertising to include straightforward brand advertising, putting NBC's fledgling cable network, says Booz, Allen's Wolf, in the forefront of a new approach to marketing communication that saw no distinction between brand advertising and direct marketing.

The company's other innovation was in how it marketed itself. The acronym CNBC prepared the way for NBC, in a strategy borrowed from consumer-product marketing, to position itself as a portfolio of products in different product categories under a consistent brand umbrella.

But CNBC had a perilously small audience. In 1990, a quick fix presented itself when cable's Financial News Network, which reached 35 million households, filed for bankruptcy and was put up for sale.

Welch placed several conditions on the acquisition, the most difficult of which involved securing guaranteed commitments for continued distribution of the combined CNBC-FNN. That meant neutralizing Ted Turner and his cable partners, who would naturally see a revitalized CNBC as a threat to CNN.

The tool used to force Turner to blink was the Persian Gulf War. NBC floated a rumor that it intended to launch a "cable war channel," programmed with pool feeds – another threat to CNN's franchise. The company would put it up on a satellite and make it available to any cable operator who wanted it. One of Rogers's former lieutenants says, "We were within 24 hours of going up, and Turner found out, and we basically swapped it for FNN." Rogers says there was never a real plan for such a service.

Either way, NBC won the FNN bankruptcy sale with a bid of \$155 million. But the victory was bittersweet. NBC's ratings were plummeting and its profits diving, to \$204 million in 1992 from \$603 million in 1989. Less than a year after authorizing the FNN purchase, Welch came close to selling NBC to Paramount.

One of the few rays of hope was the Olympics, to which NBC owned the US television rights. Together with Cablevision, the nation's fifth-largest cable operator and the co-owner of several programming services with NBC, Rogers's unit devised a plan to put the extravaganza at the center of an ambitious convergence experiment. The idea was to supplement the broadcast network's coverage of the Barcelona games with pay-per-view coverage on three dedicated cable channels. The scheme seemed almost foolproof. Crews would already be in place; subscription fees promised a neat new revenue stream; and NBC had 90 million broadcast households to which it could promote the spectacle.

But the TripleCast, as it was called, lost NBC about \$100 million. And Tom Rogers shouldered the blame. "People thought that was the demise of Tom Rogers," says one former executive. "They thought that was the big one that would bring him down."

Yet something else happened entirely. Rogers was promoted – to executive vice president, later taking the additional role of chief strategist. The lesson of his revival was not lost inside the company. As Kenneth Bronfin, then an executive in the budding new media unit, recalls it: "NBC sent a clear message that Tom was being rewarded for risk-taking."

The TripleCast, though, reinforced NBC's financial risk-aversion. Time and again, fearful of earnings dilution, the company would pass on large acquisitions, including buying the Family Channel last year and, just this past summer, merging with the USA Network. At the same time, NBC and GE were reinforced in their belief that even cable was not enough. "That didn't solve the problem of the broadcast networks," says Tom Wolzien, a former business development executive. "They knew they had to come up with different stuff."

A crew of young MBAs inside Rogers's business development unit had no doubt what that different stuff had to be: digital.

en Bronfin was having trouble getting people to focus. Everyone assumed digital television was around the corner. But few were grappling with the one question he considered crucial: What to do with the digital spectrum once they got it?

"The limits on most people's creativity was, 'We'll do three video channels and five audio channels,'" recalls Bronfin, now a senior vice president in the Hearst Corporation's new media division. "I said, 'It could be a lot more than that. More and more and more channels. So what are the things we're gonna want?"

To test the potential of digital telecasting, Bronfin was developing a technology to allow broadcast television to come in on a desktop PC and simultaneously push related Web pages into the computer. How could he get his superiors to sign off on the project, which was called Intercast? "I said," Bronfin recalls, "'The way to get Tom Rogers interested in this is to create technology that can make money immediately.""

Bronfin concocted a business plan that showed profitability in the first year, partly by getting Intel to invest in the creation of Intercast. He took the proposal to Marty Yudkovitz.

Just as Tom Rogers had signed on to be Wright's henchman, Yudkovitz, a lawyer in NBC's sports division, had offered himself to Rogers as his instrument of change. He took charge of organizing Rogers's business interesting new projects. Inside the company, execs called this funny money "peacock dollars." They were shameless in the way they played with them. Once, Yudkovitz tried to get Intel to increase its ante in Intercast by demanding, "We are the NBC peacock. We are value. If you wanna have the peacock, you're gonna have to give us something!"

While Wright and others busied themselves trying to resurrect the lumbering NBC broadcast network, the MBAs eagerly parlayed the peacock treasury into various digital schemes.

At the height of the CD-ROM craze in 1994, a young staffer developed a plan for a CNBC disc. Teaming with a CNBC business development executive, they found distributors and technicians who were willing to finance all but \$20,000 of the product, in return for the CNBC brand label and some \$75,000 worth of advertising on the cable network. The CD-ROM, titled *Your Portfolio Interactive*, which also directed people to the online Reuters Money Network, ended up making

## The pitch: "We are value. If you wanna have the NBC peacock, you have to give us something."

development unit. It was an apt pairing. Yudkovitz, 44, is a bald, brash scrapper with the disposition of an osprey, always on the lookout for any deal that might score cash for NBC's coffers. "When you are out there playing the game, the deal flow occurs," Yudkovitz says of his business philosophy. "You find yourself in the middle of the deal flow, you find yourself in the information flow, you have yourself a seat at the strategic table." Although the digerati MBAs used to joke about Yudkovitz - they called him "Beethoven," because he could expertly orchestrate his unit's affairs even while being deaf to the actual music of convergence - they were drawn by his hunger for opportunities.

Those opportunities, of course, absolutely could not cost – thus requiring a novel type of currency. This generally took the form of take-it-or-leave-it offers to trade NBC's brand name and the credibility attached to it for cash up-front and an equity stake in

NBC about a quarter of a million dollars.

With such experiments, it began to dawn on Rogers, Yudkovitz, and their team that the ancient television concept of audience flow could be applied to new media. They could herd viewers not only from Seinfeld to Frasier, but from one medium to another. Or, as Lisa Simpson, then the director of business development at NBC News, puts it: "The way to unleash value from distribution control is to arbitrate the audience, and out of that audience arbitration you can grow the NBC brand."

Yudkovitz dispatched the MBAs to find ways to capitalize on the new insight.

"These are assassins," he says. "You shove them out the door and say, 'You come back with a carcass or you don't come back.' Half the people in the world will dissolve into tears. And the others will go out and say, 'I do not necessarily know what I am looking for. But I'll know it when I see it, and I will kill it.'"

### NBC

**◄ 259** It was just about then that Microsoft came calling.

elevision wasn't even on Microsoft's radar screen when it began its search for a primary news provider for its forthcoming online service; it was looking for a newspaper. "The broadcast networks are dinosaurs," Nathan Myhrvold, the executive in charge of networked media, repeatedly told his staff.

He soon recognized that the broadband environment would eventually require sound and pictures, but even then, finding a TV partner to dance with proved difficult. ABC, the gold standard in news, was his content team's first choice, but it had its own plan for going digital. The second choice was CNN. But several meetings ended inconclusively. So a young Microsoft executive made a suggestion: How about NBC?

platform, as significant a departure from broadcasting as television had been from radio. "None of the other networks got that," recalls Mark Benerofe, the Microsoft executive leading the partnership search. Both companies also shared a vision of the riches that would accrue from the combination of advertising and subscriber fees, the very model that had delivered wealth to owners of cable networks.

That potential wasn't lost on investors. When the deal – by which NBC, in return for \$4.5 million, granted Microsoft exclusive online rights to its content and agreed to jointly develop new services and do comarketing – was announced on May 16, 1995, Microsoft shares shot to an all-time high of 84%. GE hardly budged. "Bill Gates made an extra \$17 billion, and we made a hundred thousand dollars or something," Ken Bronfin recalls. "It was a sad day."

Sadder still was the MSN kickoff a few months later: The service crashed on launch. It was a harbinger of an ongoing by creating CNN, Headline News, and the Airport Channel.

Microsoft, meanwhile, was negotiating with Turner, who had come to Bill Gates seeking funds to make a run at the hapless CBS. An ownership position in a network, Microsoft came to believe, was a major evolutionary step toward convergence.

It was Welch, at a biannual planning meeting, who brought the partners back to the same table. Listening to NBC News explain the need for a cable channel and to NBC Interactive detail its vision for an enhanced Internet presence, he asked, in the best peacock-dollars tradition: Why not combine the two ideas and get Microsoft to pay for the new cable network?

Marty Yudkovitz called Microsoft's lead dealmaker, Peter Neupert. As both reconstruct their conversation, Yudkovitz asked, "What's going on with Turner? Don't forget about us."

"Well, you know, Marty, I don't really think of NBC News as having the worldwide presence and capabilities of CNN," Neupert replied.

"No, no, no, Peter, you've got it all wrong," Yudkovitz insisted. "In terms of reach, in terms of the overall meaning of the brand, in terms of the vastness of content, this is the company that makes sense."

Ted Turner forced the issue. In September, he sold Turner Broadcasting to Time Warner. Microsoft, hungering for a network, turned around and offered to buy 10 percent of NBC. Welch rebuffed Redmond. But in a meeting in Wright's office, Rogers and Andrew Lack, who had joined the company as news-division president two years earlier, made a counterproposal directly to Gates. NBC was willing to transform America's Talking, its somnolent cable talk-show network, into a news channel, sell Microsoft half, and link it with a branded Internet site.

The deal smelled less strategic than opportunistic. The \$220 million acquisition price for the cable channel covered virtually all of NBC's development costs in cable since the launch of CNBC. And the roughly \$200 million in operating costs that Microsoft was willing to guarantee would pay almost all the additional costs in maintaining the new network, over and above what NBC was already spending to run America's Talking.

But Lack had seen the strategic prospects

## If convergence was real, NBC couldn't stop at a cable-Internet marriage.

The proposal sat poorly in Redmond. NBC had slipped to third in the ratings. In news particularly, the company was a laughing-stock; only a year earlier, the network had replaced its unpopular division president after a scandal over the doctoring of a newsmagazine segment. But with the deadline for Microsoft Network beta-testing drawing nearer and no partner in view, the content team reluctantly agreed to take a meeting at 30 Rock.

Where the other networks had played coy, NBC pitched ardent woo. Into sports president Dick Ebersol's conference room trooped not only the leaders of Rogers's and Yudkovitz's nascent interactive unit, but executives from most of its major divisions – sports, marketing, news, cable. The Microsofties quickly saw that these people gleaned the big picture: The venture wasn't about starting a newswire or finding a new promotional outlet. A partnership with Microsoft, NBC affirmed, was a step toward developing an entirely new distribution

culture clash between the partners. The broadcasters couldn't understand the software company's rush to put things out to the public before the bugs had been fixed. The tensions – "We get it right the first time: We're NBC" versus "You don't get it; this is software: We iterate" – were smoothed in the back channel maintained by business-development execs in both companies. Still, when Microsoft and NBC each began exploring further developments in convergence space, neither considered the other. Instead, they thought about Ted Turner.

NBC was almost obsessively focused on Turner. A year earlier, GE chair Jack Welch had offered to buy Turner's company, merge it with NBC, and save \$200 million through layoffs and consolidation – an overture Turner rejected. Now NBC wanted to start a cable news channel, to assure consumer recognition of the NBC brand once the billion-channel universe opened wide, and to amortize the cost of news across multiple distribution platforms, as Turner had done

inside the deal. If convergence was real, then NBC couldn't stop at a cable-Internet marriage. The broadcast network, too, had to be involved. Lack believed that the network's real value lay in its ability to direct chunks of its audience to cable and the Net, where the viewers' economic value might be extracted more efficiently than it could on the troubled broadcast medium. Instead of keeping news stars like Tom Brokaw and Jane Pauley tethered to broadcasting, Lack recommended that NBC repurpose them, the same way Viacom was repurposing Happy Days on Nick at Nite. In other words, instead of being a protectorate, the broadcast network would be the tail, wagging the dog of new media. "The strategy," Tom Rogers explains, "was to use the network to create a brand presence for us in this convergence world."

MSNBC Cable and MSNBC Internet were launched in the summer of 1996 – the first large-scale convergence experiment in the age of the Net. Under Lack's direction, NBC News remade itself to present a unified brand position. *Dateline NBC* was stripped across five prime-time hours; the show's anchors, Stone Phillips and Jane Pauley, became prominent figures on MSNBC Cable.

Indeed, Tom Brokaw has routinely directed viewers to MSNBC Cable and Internet – the latter of which received a significant boost when Microsoft gave it high billing on its Internet Explorer channel bar.

But the quality of the video news programming has certainly sunk below earlier standards. Two years ago, Lack told me one of his goals was to re-create the depth and quality of the legendary CBS Reports documentaries on which he'd once worked. Instead, MSNBC, CNBC, even Dateline routinely spool the tabloid reel. And it's taken the better part of two years to get NBC News personnel to stop thinking of the Net as more than a stepchild. When news veteran Andrea Mitchell landed a Nigeria-related scoop too late to break on the network and took it to the MSNBC site last summer, it was considered. says MSNBC Internet editor in chief Merrill Brown, "a consciousness breakthrough."

Coordinating advertising sales has been an even bigger problem. NBC insisted that a separate sales force was needed to sell each medium, limiting the growth of MSNBC Internet and any opportunity to fashion 262 >

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### NBC

▶ 4261 integrated marketing campaigns for advertisers. "Good ideas have been slow to get executed," complains former Microsoft exec Neupert. "Our relationships on the editorial and production level have been good, but on the sales level, those relationships have been competitive."

The largest dilemma facing the new partners, though, was that their financial model for convergence was not working. Even after the Web vanquished the proprietary online model, NBC and Microsoft clung to the belief that subscriber fees and advertising revenues would fuel convergence media. Wrong. "That model," Wright says, "became shaky almost before the ink was dry."

he failure of the fee portion of the business model was already apparent in the early days of MSN. With television viewers flocking to the prime-time shows that had

rocking the networks, looked comfortingly familiar. These aggregation sites appeared to be conforming to the same theories of audience flow that had helped make NBC the commanding TV network of the mid-1990s. Get viewers in the morning with a top-rated *Today* show (the theory went) and you'll have them after they come home from work, when you can take them from Tom Brokaw to an 8 p.m. sitcom, a 10 p.m. drama, over to CNBC for Geraldo, back to the affiliate's local news, and into *The Tonight Show*. Then they'll start all over with you again tomorrow morning.

Networks or search engines, the strategy was the same: These are portals to which audiences return repeatedly as they maneuver their way through a larger space. "The network business is the business of aggregation," Bob Wright came to believe. Adds Tom Rogers: "As things move to a single appliance and what's available on the computer becomes available by remote control on the television set, what is an Internet portal

### Networks or search engines, the strategy was the same: Create portals for return audiences.

powered it back into first place, NBC assumed it could flow them onto official pay sites built around those programs. Instead, wired viewers were constructing and surfing to free Web sites for *Friends* and *Seinfeld*.

The paucity of advertising was a bigger blow. Even when independent monitoring showed that MSNBC Internet had become perhaps the most widely used general news service on the Web, advertisers refused to follow.

If the traditional television-industry approach – sell advertising against audience-attracting content – didn't work, what then?

The answer seemed to reside with the Internet search engines. Users were increasingly gravitating toward them, even making them their homepages, as they tried to navigate through an ever more crowded Net. This sheer bulk had made search engines among the few places on the medium to draw significant advertising revenue.

NBC, though, saw something that, for the first time since convergence had begun today may well evolve into the starting point for the television user tomorrow."

As portalmania coursed through the media industries this year, boosting search-engine share prices, pressure increased on NBC to do a deal before a deal became too expensive to do. After considering and rejecting the idea of building its own portal site with licensed technology, the company went shopping. Everywhere it looked, it felt the hot breath of competition, especially from ABC. "We saw those Disney ears in a lot of the stores we were in," says Wright. "We saw them in the Infoseek store, we saw them in the Excite store, we saw them in the Yahoo! store. It did give us a sense of urgency." The more so, since the publicly held search engines were too rich for GE, which scotched a possible deal with Infoseek because it would have been too dilutative. (NBC also passed on a deal for the HotBot site built by Wired Ventures, the former owner of Wired magazine, because Wired wanted the arrangement to include

all its properties. Wired Digital – including HotBot – was recently sold to Lycos.) NBC eventually settled on one of the few search engines still available on the cheap – Snap.

Introduced in the fall of 1997 by CNET, an Internet media company, Snap had one of those liabilities that, in the Wonderland of new media, can seem advantageous: It had no audience. User traffic last April amounted to a paltry 1.67 million visitors, less than 10 percent the number using Yahoo!, according to the Media Metrix rating service. But it was traffic (rendered, like a bounty hunter's prey, as x-dollars-per-head) that had made the public search companies' market caps so astronomically high - \$5.5 billion, in Yahoo!'s case. CNET was willing to part with 19.9 percent of Snap for just \$5.9 million and, later on, another 40.1 percent for \$32 million more. NBC took the deal, and bought 4.99 percent of CNET itself.

The acquisition represented an ultimate form of wag-the-dog: The belief that in the time left before conventional networks disintegrate, NBC, CNBC, and MSNBC can use their promotional power to build the Snap brand into a portal so formidable that it will be able to drive people back and forth between NBC properties when convergence occurs.

CNET stock nearly doubled within two months of the deal. Shares in the other search engines also surged. A week after the Snap deal, Disney agreed to buy 43 percent of Infoseek, in a complex arrangement that will ultimately cost it between \$200 million and \$450 million – a sum that ain't peacock dollars.

BC's portal strategy doesn't end with Snap. Senior executives foresee networks, broadcast and cable, evolving into niche portals to convergence space, each themed around broad consumer interests, each serving as a gateway to and return anchorage from a limitless universe of digital text, sound, and video offerings.

The company's current Web products and television sub-brands could become entry-ways for different classes of consumers:

MSNBC for people interested in general news, CNBC for those invested in finance and business, NBC.com for consumers attracted to entertainment. NBC Interactive Neighborhood, which provides the affiliates

locally oriented Web gateways replete with regional classified ads, weather reports, even scrolling headlines from the nabes, could replace the local stations – or assure their continued vitality when the Web renders geography otherwise moot.

"Specialty portals are a fundamental ingredient here," says Rogers, who is either more forthright or foolhardy than his associates in projecting the post-TV future. We are sitting in his cramped office across from Wright's on 30 Rock's 52nd floor. At the far end of the room, a TV screen displays CNBC, with a tailored analog feed providing GE's real-time share price. A second, outfitted with the newest iteration of WebTV for Windows, seamlessly blends MSNBC Cable and Internet.

"We moved away from thinking that aggregation is created merely by content," Rogers is saying. "Now, it's having the simple, easy way to access things. If you can create an overall general portal, you don't have to own the underlying content."

While the strength of its TV networks may give NBC a brand-building, audience-driving advantage over plain vanilla Internet services, portals represent, contra Wright, an inversion of the traditional network business, not a re-creation of it. Under portal economics, television revenues derive not from control of pipeline or content – both of which are now ubiquitous – but by providing consumers the most efficient access to the content. This model, as media investment banker Richard MacDonald says, is "a telecommunications model," not unlike the one that has guided the long distance market since deregulation eliminated AT&T's monopoly.

This model is fraught with risk, as the long distance providers have learned. Portal economics is open to commodity pricing pressures. It's also subject to suppression by new kinds of monopolies – in particular, those that might be created by cable operators with digital set-top boxes that tune automatically to their own portal sites. Indeed, NBC executives believe that monopoly control of portal space will eventually turn into a regulatory struggle that could pit the company against Microsoft, which is heavily engaged in set-top development.

"A real challenge," says Tom Rogers, "is the cable operator – or whoever controls the set-top box, whether it's Microsoft or 264 ▶

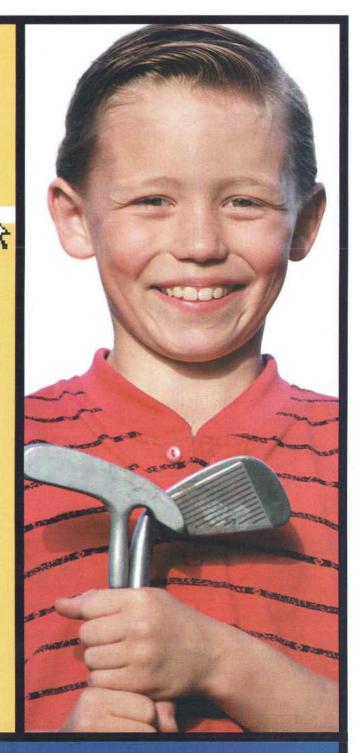
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### NBC

**◄ 263** cable operators – becoming a middleman. That is going to be a very major public policy battle, because I think the starting point on your television set is effectively going to be your starting point for everything that a PC does today."

Even if the networks win that battle, portal theory represents an enormous, a-historical gamble: that in a convergence world of limitless homepages, people will choose those provided by traditional TV outlets.

The television companies and their allies base their confidence on two articles of faith: Consumers will remain with existing brands even as new ones emerge; and its continued inertia will lead the mass audience to abjure the wired world's delights and bring it back repeatedly to the same place. "Yes, there will be infinite choice," says CNET founder Halsey Minor, "but I don't think people want it."

But many media consultants and senior advertising executives, including those

that Disney – with its expensive maneuvering to acquire and amalgamate Starwave and Infoseek, and its decision to turn the heavily trafficked Infoseek into consumer portal Go.com – seems more prepared to follow.

"I would much prefer to end up where Disney is, where they have significant traffic today, a reasonable management team, talent in place," says Peter Neupert of the networks' portal plays. NBC's Snap deal, he says, "is like me saying, 'I'm going to go into their TV production business, but I don't want to hire the best talent.' I want to know who the Tom Brokaw of Snap is."

GE's unwillingness to shoulder the steep costs of convergence has persuaded many on and off Wall Street that Jack Welch is preparing to sell his television company before he retires two years hence. It also taxed some of its most creative digerati, who fled NBC for more fertile ground. "You become much more creative in an environment like that," one of the emigrants told me, "but the problem is, you end up with

GE analyst at Prudential Securities. So much so that he predicts ecommerce could earn NBC between \$100 million and \$200 million annually as early as 2002, more than offsetting a decline in broadcast network earnings to \$475 million or \$500 million, from \$573 million in 1997.

Far from impinging on its parent's profitability, NBC's "postindustrial economic model of infotainment and transaction processing" could, Heymann believes, contribute as much as 10 percent to GE's billion-dollar-plus operating profit shortly after the turn of the century, up from 7.7 percent now. "Nobody else in the media industry," he says, "has the resources GE can draw on to make the Net a success."

aybe that's why Bob Wright, for all his anxiety over failure, seemed comfortable with the ambiguities of his pay-as-you-go convergence strategy – even as he refused to affirm that today's way is the right way.

At one point when I pushed him a bit far, he interrupted me, not with annoyance, but with a burst of nervous enthusiasm.

"Look, I can't answer your question about what happens in five years," he said. "People keep coming to me and asking, 'Well, you know, you lost all that *Seinfeld* audience, so how are you gonna survive?"

"Right, right," I goaded.

"And I say, 'Well, it's like the *Cheers* audience we lost and it's like the *Cosby* audience we lost.' You have to just find ways to keep them connected."

But there'll be real-time, full-motion video on the Web, fragmenting that audience into a billion bits, I responded.

"Plus," he added, "you'll have a digital set-top device on some kind of major display in your home that will bring in two or three times as many package services as there are today."

"So," I asked the president and CEO of America's last profitable broadcast network, "why aren't you jumping out the window?"

"We don't have to just watch everything crumble," Bob Wright said, against a backdrop of 10 framed pictures depicting the evolution of the NBC logotype, from its radiodays ownership by RCA to the animated peacock of today. "You have to give us credit that we can be adaptive."

### "The starting point on your TV set will be your starting point for everything a PC does today."

otherwise smitten with NBC, see the future differently. They believe the networks should refocus themselves on the development of quality entertainment – in particular, the kind that will play well on the large-screen, high-definition television sets beginning to come to market. "There's a difference between an NBC that gets a real audience with a real product, and a portal that you pass through on your way to something else," says Mike Samet, head of Young & Rubicam's interactive division.

A more chilling prospect, though, is that portal theory is solid – but that NBC's stinginess will prove inadequate to the task of executing it. Peacock dollars may be fine fuel for the fantasies of young MBAs. But they have the value of Monopoly money in a game that requires serious players to "prepare to make a significant up-front investment to establish a dominant position quickly," as a recent Andersen Consulting report on ecommerce put it. That's a path

a lot of pasted-together ventures that nobody is really supremely happy with."

NBC's response to such criticism is subtle but strong. True, executives say, they may not be spending enough to assure quick leadership in new technological territory. But if portal theory goes the way of push theory goes the way of content theory, they also won't be stuck with an expensive, wasting asset that will depress earnings and share price. In the convergence wars, NBC contends, the better strategy is not to win, but to not lose.

The company's fans also believe that GE's resources, particularly the financing, insurance, and credit-insurance capabilities inside GE Capital, give it formidable strength in electronic commerce that Disney and other competitors cannot easily match. By moving into portal space, NBC is positioned to be "a one-stop facilitator for consumers to purchase products on the Net," says Nicholas Heymann, a leading

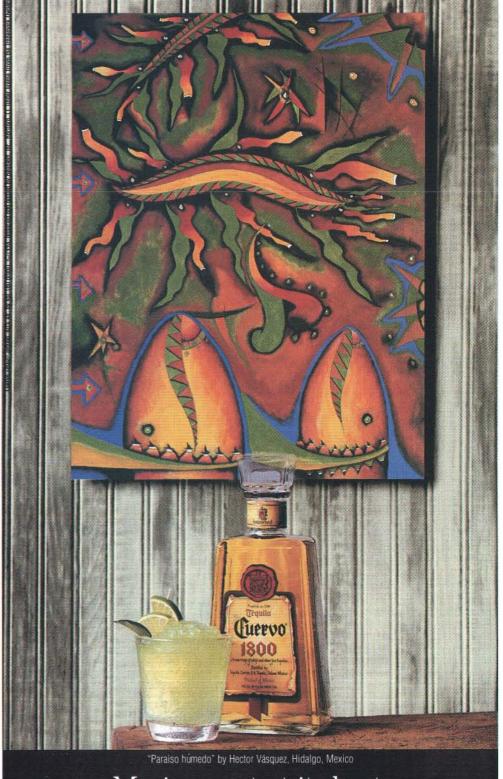
### WIRED

Statement of Ownership, Management and Circulation (Required by 39 U.S.C. 3685)

- 1. Publication title: Wired.
- 2. Publication number: 011-724.
- 3. Filing date: October 1, 1998.
- 4. Issue frequency: Monthly.
- 5. Number of issues published annually: 12.
- 6. Annual subscription price: \$39.95.
- Complete mailing address of known office of publication: 520 Third Street, San Francisco, CA 94107.
- Complete mailing address of headquarters or general business office of publisher: 520 Third Street, San Francisco, CA 94107.
- Full names and complete mailing addresses of Publisher, Editor, and Managing Editor: Publisher: Dana Lyon, Advance Magazine Publishers Inc., 520 Third Street, San Francisco, CA 94107. Editor: Katrina Heron, 520 Third Street, San Francisco, CA 94107. Managing Editor: Martha Baer, 520 Third Street, San Francisco, CA 94107.
- Owner: Advance Magazine Publishers, Inc. 350 Madison Avenue, New York, New York 10017 Through intermediate corporations to Advance Publications, Inc., The Advance Voting Trust, sole voting stockholder 950 Fingerboard Road, Staten Island, New York 10305
- Known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities: None.
- 12. N/A
- 13. Publication name: Wired.
- Issue date for circulation data below: October 1997 September 1998
- 15. Extent and nature of circulation:

		Average Number of Copies Each Issue during Preceding 12 Months	Actual Number of Copi of Single Issue Publish Nearest to Filing Date
a.	Total no. copies (net press n	un) 653,000	625,754
b.	Paid and/or requested circu	lation	
	<ol> <li>Sales through dealers carriers, street vendors counter sales</li> </ol>	and 86,517	89,700
	<ol><li>Paid or requested mail subscriptions</li></ol>	412,401	365,217
C.	Total paid and/or requested circulation	498,918	454,917
d.	Free distribution by mail (so complimentary, and other f		12,204
e.	Free distribution outside th (carriers and other means)	e mail 2,800	854
f.	Total free distribution	11,855	13,058
g.	Total distribution	510,773	467,975
h.	Copies not distributed		
	<ol> <li>office use, leftover, spo</li> </ol>	iled 10,300	12,744
	<ol><li>Returns from news ag</li></ol>	ents 131,927	145,035
i.	Total	653,000	625,754
	Percentage paid and/or requested circulation	97.68	97.21

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### Murder

◄ 216 trucker, competitive but good-humored, held the record at the nine-hole course. He played in the Saturday-morning men's league, and a few years back he'd worked for course owner Lee Webb, taking care of the grounds, helping out in the office, and giving lessons.

Dean was also a familiar face at CB shops around Pierceton. Like Chris Marquis, he'd been bitten by the radio bug. Unlike Marquis, though, Dean was a licensed ham operator, and he was never known to be anything but considerate on the air.

Dean had grown up in Michigan, earned his commercial driver's license in his late 20s, and landed a job hauling steel out of Las Vegas. A few years later, he moved to Pierceton with his second wife, Diane. For a time, he worked for Webb at Little Big Horn. By 1995, though, he had landed a position with a distribution outfit called Sprint North Supply Company, which paid better and offered benefits. He drove a flatbed out of the company warehouse in Warsaw, Indiana, usually loaded with huge wooden spools of black telephone cable, earning \$2,300 a month.

Dean was obsessively neat. Neighbors remember him constantly washing his cars – a Corvette and a Blazer. Joe Stump, his landlord, recalls that Dean kept his lawn buzzed down practically to AstroTurf length. "And the house was always spotless inside," Stump adds.

Indiana: a Ranger RCI 2990 in return for a Cobra 2000 CB radio. The RCI, a sleek, rack-mountable black box, was a 10-meter amateur radio that had been modified to handle CB transmissions. Another hack enabled the radio's user to "freeband" – go outside of the 40 channels the FCC allocates for CB transmissions. A compression board had been installed to boost speech levels. "It was the loudest thing on the air," says Gonzo, who estimates that all the enhancements bumped the radio's value up to nearly \$800.

What was strange about the trade was that a Cobra 2000 is worth only about \$400. It's an older radio – all brushed steel and simulated wood grain – an emblem of CB's 1970s heyday, when *Smokey and the Bandit* and C. W. McCall's populist trucker anthem "Convoy" made the once-obscure hobby suddenly hot. Gonzo was puzzled; why would someone trade a radio worth \$800 for one worth half as much?

When he visited Chris, Gonzo saw the 2990 Dean had sent. Then Chris told him that instead of sending Dean the Cobra 2000 he'd promised, he had shipped a Realistic mobile radio that didn't even work just so Dean would have a tracking number as the two shipments crossed in the mail. (Apparently, Chris had learned a lesson from the deal with Sischo.) As soon as Dean had gotten the junk radio, he'd started making threatening calls and sending hostile email. In one message Dean said he was coming to Vermont to sort things out.

## When he received the junk radio, Dean got hostile, threatening to come to Vermont to sort things out.

He liked to hunt, according to Don Chilson, pastor at Pierceton's Bethel Baptist Church and a golfing buddy of Dean's, and he took tae kwan do lessons at an academy next to the grocery store in Pierceton. He'd also recently configured his computer to access the Net.

It was online that Dean first encountered Chris Marquis, according to Gonzo. Chris had confided in his friend about his dealings with Dean. He'd told Gonzo about a fantastic trade he'd negotiated with a guy in As Gonzo recalls it, as soon as he and Chris were alone, the teenager confessed to worrying that Dean would show up at his door. Dean had just called again, he told Gonzo, but his mother had covered for him. He asked what he should do; Gonzo advised him to give the radio back. But a short while later Chris was upbeat again. Gonzo noticed that the boy always felt sure his mother could protect him from any real harm.

Indeed, when Dean had called that day, Rockwell had blithely told him her son wasn't in Vermont – she said he had been thrown in jail in another state.

Vermont enjoys a crime rate among the lowest in the nation. The day before the explosion made news, the front page of the *Rutland Herald*, one of the state's biggest newspapers, featured these two stories: "Skier Cuts New Trails as Activist" and "State Has Trove of Documents on Civil War."

On Friday, in the *Herald* and *The Burlington Free Press*, the daily that serves the state's most populous city, the bombing moved center-stage, with huge black headlines, sidebars, and graphics explaining how to identify letter and package bombs. The broadcast media descended on Fair Haven; satellite trucks, with their noisy generators, lined the streets near Sheila Rockwell's house.

"It was quite a day for this little Mayberry town," says Bill Eaton, a retired school-teacher who has lived in Fair Haven all his life. Eaton, who used to go on fishing trips with Armand Gevry, the UPS driver, had grabbed his camcorder to document the scene at 3 Washington Street. In addition to the media, agents from the FBI and the Bureau of Alcohol, Tobacco, and Firearms had arrived to join the Vermont State Police in the search for evidence. Scouring the wet ground, they found pieces of debris from the explosion as far as three lots away.

On the rec.radio.cb newsgroup, TomCat was beginning to feel the heat. In a message titled "Was mad but not a killer," he said he had been fielding numerous calls from newspaper reporters asking if he was the bomber. TomCat declared himself innocent.

"I do not know anything about that incident with Chris Marquis," wrote TomCat. "I only found out about it today, and immediately called the FBI, introduced myself, and told them about his bad business dealings, and that I did in fact say ugly things on the newsgroups about him...But that is where it stopped...Just my telling the readers about his shady business practices...As I said, I called the FBI and said I will GLADLY answer any or all questions about this tragedy."

When FBI agents searched Chris Marquis's room, they found a piece of notebook paper on his desk, next to the computer his mother had given him for Christmas. On the paper was written Chris Dean's name, along with

Dean's address and phone number, according to an FBI affidavit.

Investigators also eventually turned up Chris's wallet, which had been in his pants pocket at the time of the explosion. Inside, according to the affidavit, was a UPS receipt dated March 5, 1998. It detailed the shipment of a CB radio from Chris Marquis to Chris Dean at the same Indiana address listed on the piece of notebook paper. The tracking number, the affidavit stated, was 1Z 019 X55 03 1232 566 3. If you visit the UPS Web site and enter that number, you can see that the package was sent from Rutland via UPS ground service on March 5 and delivered to Pierceton, Indiana, at 1:56 p.m. on March 11.

And the name and address on the bomb package, Samantha Brown of Bucyrus, Ohio? That was a dead end. The FBI discovered that neither the person nor the street address existed. UPS traced the path of the package, and, according to the affidavit, it had been dropped off at a counter facility in Mansfield,

CW also told the authorities he was the one who had helped Dean configure his computer to access the Net. And he added that Dean had recently searched the Net to find instructions on building a pipe bomb. Based on the ingredients mentioned in the FBI affidavit – thumbtacks, a clothespin, black powder, and a pipe – and, assuming the friend's statement is accurate, Dean probably found an online version of *The Anarchist's Cookbook*, a guide to homemade mayhem that existed in print long before it found its way into digital form.

On March 14, according to the affidavit, five days before the explosion in Fair Haven, Dean had told CW that he "was going to send the guy a package in the mail, and, boy, is he going to be surprised," but Dean seemed to be ambivalent about what he wanted to do, because he also talked about simply paying Chris Marquis an intimidating visit.

CW's assertions, and the Sprint log entry showing that Dean was in Mansfield on

### On the rec.radio.cb newsgroup, TomCat insisted he "was mad but not a killer."

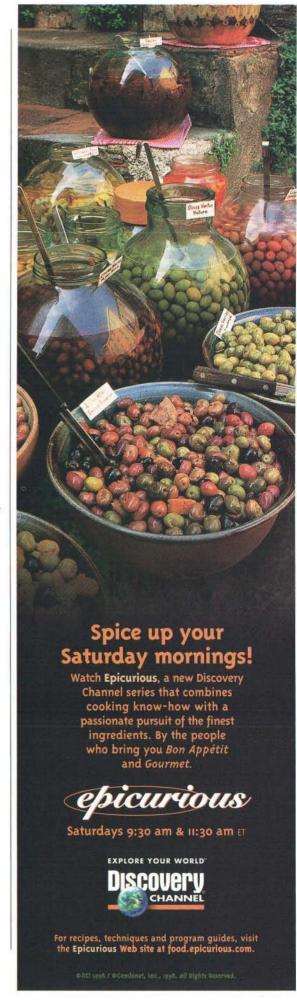
Ohio, around noon on March 18. It was shipped next-day air.

A representative of Sprint North Supply, Dean's employer, told the Feds that the truck driver's route included Indiana, Ohio, and Michigan. The spokesperson also mentioned that Dean was making a delivery to a company warehouse in Mansfield, Ohio, at around noon on March 18. (Bucyrus, Ohio, coincidentally, is a town along Route 30, a major east-west artery. A trucker would likely pass through it on the way from Pierceton to Mansfield.)

On the night of March 19, Special Agent John Hersh of the Rutland FBI office interviewed a friend of Dean's. According to Hersh's affidavit, the anonymous cooperating witness (referred to as CW in the document) had known Dean for several years and shared his affinity for CB radios. CW said Dean had been having trouble with someone in Vermont after they'd exchanged radios.

March 18, led the authorities to believe that they'd found their man. By Friday evening, the day after the explosion, an ATF agent had been dispatched along with members of the Kosciusko County Sheriff's Department to arrest Dean. They found him at a friend's house in Winona Lake, Indiana, a few miles west of Pierceton. The entire investigation and arrest took less than 30 hours.

On Saturday morning, the front page of *The Burlington Free Press* trumpeted, "Bombing Suspect Arrested." There was a color picture of Chief Viger standing next to the US attorney who had announced the arrest. The accompanying article noted that Dean, who had no prior criminal record, was being charged with the interstate transportation of an explosive device intended to kill and injure, and causing an explosive device to be placed aboard an aircraft, knowing that it could endanger the safety of people aboard. The article also pointed out 268 >



### Murder

**◄ 267** that, if convicted, Dean could face the federal death penalty.

Suddenly, TomCat was silent. After his "Was mad but not a killer" message, posted the same day Dean was arrested, TomCat vanished from rec.radio.cb.

What did it mean? Was he a suspect, after all? Could he possibly *be* Dean – and silent now because he was in custody? (Several people who corresponded with TomCat insisted that was ridiculous. And, certainly, TomCat's posted description of himself as 6 foot 5 didn't jibe.) The authorities weren't commenting.

America Online, TomCat's ISP, didn't wait to find out. The company said he had violated its terms of service, which prohibit threatening Usenet messages, and voided his account. AOL also sent out 16 "cancel" messages to the operators of Usenet servers around the world. TomCat's venomous screeds disappeared into the ether.

After his arrest in Winona Lake, Dean was sent to the Allen County Jail in Fort Wayne, Indiana. A few days later, on March 25, a US magistrate in Fort Wayne ruled that there was enough evidence against Dean to extradite him to Vermont, where he would stand trial.

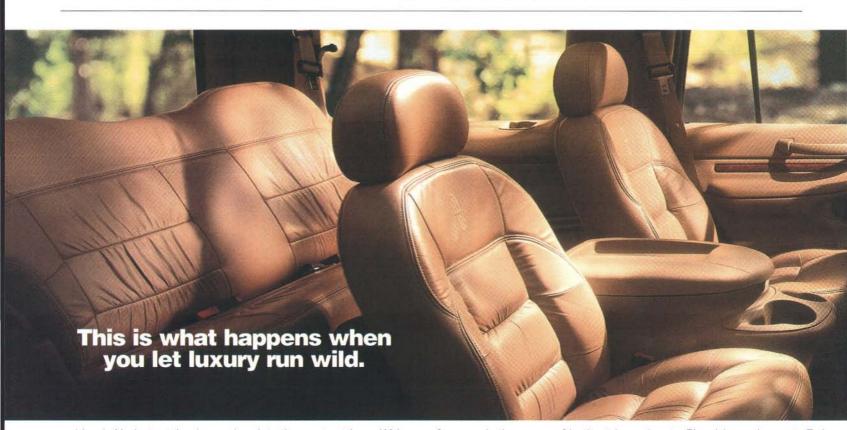
US marshals escorted Dean to Burlington on April 2, and he was remanded to the maximum-security Northwest State Correctional Facility in Saint Albans, just a few miles from the Canadian border. It was that same afternoon – exactly two weeks after the bombing – that a closed-casket funeral service for Chris Marquis was held in the Mallory Funeral Home.

After protracted legal wrangling, on June 22 at the US District Court in Burlington, Dean entered a plea of not guilty on all counts. His three attorneys steadfastly maintain their client's innocence. "He has a solid and rich employment history, the respect and support of his neighbors, and the love and support of his family," says attorney Bradley Stetler. "He has lived a very typical middle-class life."

Last summer, people in Pierceton were still trying to reconcile the government's charges with the Chris Dean they knew. Dean was "personable, fun to be around," according to his landlord. "He got along with everybody." "He was very friendly and outgoing," says a man who owns a CB shop that Dean frequented. "[The charges against him] seemed real out of character."

But in the weeks leading up to Dean's arraignment, FBI and ATF agents had been gathering more evidence. According to court documents, agents searching Dean's house found a styrofoam container – with missing pieces – that seemed to match the material used to encase the bomb mechanism. They found hex nuts that appeared to be identical to the hardware used as extra shrapnel in the bomb. They found fishing line similar to that used as part of the bomb's trigger mechanism.

In Dean's backyard, agents found evidence of a blast hole where, they assert in court documents, Dean detonated a prototype bomb. "Indeed, agents found the test bomb's end cap, which appeared to be made by the same pipe manufacturer that made the end cap for the bomb that killed Marquis," wrote Charles Tetzlaff, the US attorney in Burlington. There was also evidence that Dean purchased Bullseye black powder on March 14, the same day he is alleged to have had the



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conversation with CW in which he seemed uncertain about whether he should go to Vermont in person or "send the guy a package in the mail."

The US Attorney's Office argued that Dean should be held without bail, pending trial. Judge William K. Sessions III agreed, and Dean was sent back up to Saint Albans.

When Sheila Rockwell wants to get some fresh air, she asks her home health aide to help her get into a wheelchair. She still has an external fixator attached to her right knee – a blue-and-silver device like a metallic Tinker Toy that penetrates the skin and holds the bones and pins in place. As a result, her right leg sticks straight out, supported by an extension attached to the wheelchair.

Once Rockwell is situated in the chair, the aide rolls her out the back door and down a newly constructed wood ramp at the back entrance of her rented house. They pass Chief Viger's window in the Municipal Building, cross North Park Place, and don't stop until they get to the far end of the town common.

It would seem to be a spot with sad associations for Rockwell. She's parked right in front of the Mallory Funeral Home, near the place where, in winter, Chris and Cyndi would lay down on the ground, sweep their arms and legs back and forth, and make snow angels. But perhaps in a town as small as Fair Haven, it's not possible to avoid all the painful places.

She claims she knew very little about her son's Internet and CB dealings. She says she had no idea that anyone other than Dean was complaining about being cheated by Chris and that even when Dean began calling the house, she was unsure about "the severity" of the threats.

Chris's mother acknowledges she knew her son was buying and selling radios, and

## Neighbors say Dean led a "typical middle-class life." The FBI found evidence of a blast hole in his backyard.

She and her son were very close. Not only did they DJ together at parties and dances, they also enrolled in a program to raise guide dogs for the blind and attended training classes together every two weeks in Rutland. Rockwell drove Chris everywhere because his retinitis prevented him from getting a license. And since Chris hadn't been going to school during the months leading up to the bombing, he was home with his mother most days.

she says that profits from the transactions were one of the family's sources of income. She regularly drove Chris to CB shops and tag sales, where he'd purchase used gear and accessories.

She also drove her son to the UPS station in Rutland to mail a radio to Chris Dean on March 5. "I knew it wasn't the radio he was supposed to send this guy," she remembers, "but Chris said, 'If I don't get him a tracking number, he's gonna kick my ass.' He



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### Murder

◄ 269 said he needed to buy some time." She says Chris told her he had actually ordered the Cobra 2000 he'd promised Dean from one of his suppliers, a Kentucky outfit called Copper Electronics; it just hadn't arrived in time, and Chris needed to send something. Rockwell adamantly insists, "I don't know where the scamming idea came from."

But Copper doesn't sell the Cobra 2000, a discontinued model. And her daughter Eileen Lavigne claims that Rockwell "was very aware of what was going on." (Lavigne and Rockwell weren't on speaking terms at the time of the explosion, but they reconciled briefly afterward. They were estranged again when I spoke with Lavigne in August.)

"She put up the money to buy the radios," Lavigne says, "and she knew he was getting on the Net trying to sell these radios."

The CB shop owner in Pierceton felt terrible when he ran into Diane Dean at Wal-Mart a few weeks after her husband's arrest. She seemed to need money, and she asked him – without her husband's knowledge – if he

would come to their house and take a look at the equipment there.

When the man arrived to appraise the radios, he was astonished by what he saw. His shop had been burglarized in January, and the police had never found the culprits. As he evaluated Dean's collection of radios, trying not to betray his surprise to Diane Dean, he estimated that about half of the equipment that had been stolen from his shop was in Dean's house – roughly \$5,000 worth of merchandise. (Eventually, this equipment was seized as evidence.)

The store owner also believes that the RCI 2990 Dean sent to Vermont was stolen from his shop. "If I'm guessing right," he says, "[Dean had] taken all this hot stuff and was laundering it through the Internet." So while the radio he hoped to receive from Chris Marquis was worth only about half as much as the 2990, "he'd be getting a Cobra 2000 that wasn't hot."

Gonzo says the Pierceton man's story makes sense to him. Not only does it explain the uneven trade, but it explains "why [Dean] didn't go through the proper channels, reporting the scam with Marquis to the police."

But despite the Pierceton shop owner's certainty that Dean was somehow involved with the burglary, he still can't believe that Dean built a pipe bomb and mailed it to Chris Marquis, as the government alleges. "Chris Dean is a fairly smart individual, and I can't see him doing it as it's portrayed, leaving such a clear trail," he says.

Maybe Chris Marquis never understood that his actions could have consequences. Perhaps he thought his online identities would somehow shield him from real-world harm. He was Psycho, or Taz, or PhantomOp. He was also proprietor of the CB Shack, 27 years old, married. If no one could figure out exactly who he was, then how could they get to him? His fluid sense of identity may have made him feel invulnerable.

Even when people like Mark Sischo and Chris Dean began closing in on the real Chris Marquis, the teenager still felt he was in control. When Sischo began sounding the alarm on rec.radio.cb and the RCI Federation site after he'd been burned by Chris, the youth had countered with a

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message of his own. Sischo was simply upset, Chris explained, because the CB Shack wouldn't sell him a radio he wanted badly. Even when an angry Dean started calling, started threatening to come to Vermont, the teen never felt he was in serious danger. If all else failed, his mother would handle it for him.

And what of the man authorities say murdered him? If the criminal charges are true, Dean made and mailed a bomb, taking no other precaution than making up a name, Samantha Brown, the girl from Bucyrus, Ohio, from whom no one would expect to receive such a nasty surprise.

Maybe it was easier to imagine killing someone he had never met. He tangled with Chris on the phone, by email, and over ICQ. But he never saw the teenager's face. Maybe his fluid sense of identity also made him feel invulnerable. Catch me if you can.

Could he – would he – have done the thing the authorities say he did if he knew that the person who'd conned him was a 17-year-old kid with failing vision, a mama's boy who spent his days on the Net and his nights on the radio talking endlessly to his devoted girlfriend? You have to wonder when it was that Dean first fixed his eyes on a picture of Chris Marquis – perhaps on TV, or in a Fort Wayne newspaper. You have to wonder what he thought.

Of course, it's possible, as golf course owner Lee Webb puts it, that "they got the wrong guy." Webb and others in Pierceton point out that if the government's accusations are true, then Dean learned how to make the bomb, tested it, and sent it all within seven days of receiving the worthless Realistic from Chris Marquis – a pretty short span of time. They argue that the government's lightning-fast investigation and arrest – 30 hours, remarkable for a bombing case – was slipshod and rushed. They want to know who doesn't have some thumbtacks, a clothespin, and fishing line around his house.

Dean's attorneys spent the better part of the summer trying to convince the US Attorney's Office in Burlington and the Department of the US Attorney General in Washington, DC, not to seek the federal death penalty for their client. They searched for every scrap of mitigating evidence they could find. The last execution in Vermont was in 1954 (the state has since abolished the death penalty), and Dean's legal team didn't want their client to be the state's first test of the 1994 federal death-penalty statute, which allows the federal government to seek execution in certain cases, regardless of state law.

On October 7, Dean's attorneys presented their findings before a Department of Justice committee in Washington; if it is the committee's judgment that the death penalty should be sought, then the recommendation is passed to Janet Reno, who makes the final decision.

"If the government seeks the death penalty, the likelihood of a trial is greater," says Greg Waples, an assistant US attorney in Burlington working on the case. But with or without tion to do the same. "I tell him man's gonna let him down and our government's gonna let him down," says Chilson. "They're out to hang him. But I keep encouraging him spiritually to place his hope in the Lord – even if they give him the death penalty – because I know where he's gonna go."

Gonzo has testified before the Burlington grand jury that indicted Dean, but he sounds annoyed about his role in the legal process. He says it has taken up his time and hurt his business. He wishes he wouldn't get called up to Burlington again to testify once the trial starts. But he knows it's inevitable, even though no trial date has been set.

Sheila Rockwell has enlisted an attorney to find out whether Chris Dean has any assets she might be able to seize in a civil

## Maybe a fluid sense of identity made both Marquis and Dean feel invulnerable. Catch me if you can.

the death penalty, he points out, a pretrial settlement could result, as happened in the Unabomber case.

It's September, and Cyndi McDonald is back in school, starting the 11th grade again. She dropped out last year after the explosion and barricaded herself in her room for three weeks. She's trying to put together enough money to buy Chris's DJ equipment from his mother. "I want to continue doing it, go on with the business," she says. Chris was her first real boyfriend. She doesn't think she's ready for another just now.

Diane Dean flies into Burlington once a month and then drives up to Saint Alban's to visit her husband, who, from all reports, is handling his ordeal as well as can be expected. When she visits, they can sit together in the same room and hold hands – there's no glass wall dividing them, no telephones they must use to communicate from either side of a partition. After the visit, though, Dean is strip-searched for contraband before he is returned to his cell.

The Reverend Don Chilson has been writing to Dean and encouraging his congrega-

trial. Before school started again this fall in Fair Haven, she helped organize a Teen Appreciation Celebration on the town green, in Chris's memory, to benefit the Vermont Youth Development Corps. She brought Chris's CD collection over, and the music boomed out as the town's teenagers – all those kids Chris had not gotten along with – played volleyball, bladed, skateboarded, and hung out. She hopes it will become an annual event.

Every few weeks, she has to visit a doctor in Rutland to have her knee checked out. To get there, you head east on Route 4. About halfway, you cross a set of double bridges near West Rutland. Rockwell remembers that when she would drive into Rutland with Chris on errands, he'd always lose radio contact with Cyndi on the bridges.

Now, another memory crowds in: A few days after the explosion, when she was still in the hospital, she asked someone on the Fair Haven Rescue Squad when it was, exactly, that Chris had died. And she was told that he'd been alive in the house, and alive in the ambulance, but that he only made it as far as the West Rutland double bridges before they lost him.

### **Bitchin' Golf Cart**

◄ 223 15 to 20. So NEVs were simply too fast to drive in lanes that golf carts share with slowmoving bicycles. But Constande's distinction was shaky. I checked with J. R. Thomas, president of Electric Car Distributors, a golf-cart and NEV dealer in nearby Rancho Mirage; he said almost all golf carts sold today go "close to 25." When I told him that Constande said NEVs weren't allowed in Palm Desert's golf-cart lanes, it was news to him. The advice he was giving Bombardier buyers was precisely the opposite. The confusion suggested that the integration of NEVs into existing traffic configurations faced considerable obstacles, even in the electric-vehicle capital of America.

It wasn't until the afternoon of Day Two that we met our first trans2 owner, Wyman Stackhouse. To find him, we took our Bombardier through the foothills of Palm Desert, past developments with names like Corsican Villas, until we located the house with the eggmobile in front. And what an eggmobile! It had two electric fans, a boombox with amplifier and speakers installed beneath the seat, a cigarette lighter attached to a Velcro patch

covered the whole golf course. He still didn't dare drive it into town.

Despite all that, he liked the car. Why, in November 1996, when Palm Desert mounted its annual golf-cart parade, Stackhouse attached foam rotors to the trans2's roof so that it looked like a helicopter and drove it in the procession. The Sturgster thought that was cool.

t was on Day Three, as we were flying from Los Angeles to Orlando, Florida, that Danman revealed he was a diagnosed, lithium-medicated manic-depressive. This came as an explanation, not a surprise. On the day I'd met him, a couple of months earlier, I thought he was acting strangely: One by one, he dismissed as irrelevant all the documents he'd previously included in my initial Dan packet. Now, as we flew over the Southwest, he informed me that he'd been having a "mild episode" that day. Soon after our meeting, he said, he found himself mired in bumper-to-bumper freeway traffic, the very thing his life was dedicated to eradicating. He did not take his confinement well. For a while he sat on his car roof. When he discovered that

somehow. It's really amazing – but nobody likes to be around you." Apparently Danman found that out when he began making 2 a.m. conference calls to his friends in the United States and relating his new insights with extravagant enthusiasm.

During two days in a Los Angeles hotel room immediately after the conference, Dan made more late-night calls: "Some people thought I was tapped into the future, and some thought I was sick." Then he flew to Mexico City for a conference of the Society of Automotive Analysts. "I felt I had the answer to the world - the code to how everything happened - and I felt that if I knew this, I'd be killed." His phone partners back home finally grasped that he was breaking down and sent help: Sonya, Dan's girlfriend of six months and wife-to-be, came, and so did his sister and a psychiatrist friend of Dan's father, who himself is a psychiatrist. Dan was scheduled to make a speech on NEVs. Dan's sister didn't want him to give the talk, but he somehow prevailed. "She got in the audience, and whenever I started to stray from my script, she would give me a real strong face: 'Get back to that script!'" He never did find out whether the psychiatrist had come to commit him or to provide support. It didn't seem to matter, for within half an hour of meeting him, Dan was sure he'd persuaded the doc to buy stock in trans2."I was pretty effective at blowing down my so-called barriers," he said, laughing.

"I was so happy down there," he said. "I was on the elevator talking to everybody and now that I had all these ambassadors taking care of me, I had no cares, and I was like a child." He returned to his family in the Midwest and was hospitalized and has taken lithium ever since. He accepts the regimen ruefully. "Can you imagine that? I have to spend every day trying not to be happy."

Although untreated manic-depression can cause profound suffering and even suicide, many people with the disease view it as blessing as well as curse, for it seems to promote creativity. The list of renowned artists and thinkers who suffered from manic-depression is long; among the Romantic poets, for example, William Blake, Samuel Taylor Coleridge, Lord Byron, Percy Bysshe Shelley, and probably John Keats all had the ailment. Dan's form is unusual in that he has had several manic episodes but is spared the debilitating depressions that typically follow.

While neither Bill MacAdam nor Douglass
Query, trans2's co-CEOs, believes Dan's illness
affected his performance for the company, 273 ▶

## A symptom of Danman's malady: Trapped in an LA traffic jam, he threw a brick through a window and zoomed down the carpool lane at 75. "I'm sick of this society," he told a cop.

on the dashboard, and a half-dozen holes in the dashboard filled by golf tees. Sticking out of the rear storage compartment were a "rattlesnake catcher" – a long pole with a constrictable noose at one end – and two fully equipped golf bags, including one with faux leopardskin trim that belonged to Stackhouse's wife.

Stackhouse, a slender man with a pink face and Buffalo Bill-style yellow-white mane, led us to his home "office." which turned out to be his bar. Then he recited the saga of his trans2, which was, if not guite a horror story, then a farce, Stackhouse, a 70-year-old retired medical-equipment manufacturer, bought his trans2 for \$8,500 in 1996, intending to use it for golf. Unfortunately, it ran out of juice short of 18 holes. He spent \$368.25 on new batteries, but it still wouldn't go 18. He tried returning the new batteries, but the company he'd bought them from had gone belly up. Stackhouse spent another \$437.90 on four bigger batteries. To install them, he had to remove the windshield-wiper assembly. The wiper no longer worked, but at least the cart

he'd locked himself out of the car, he threw a brick through a window. Then, honking his way through a torrential rain, he drove 75 mph down the carpool lane. A police officer pulled him over and asked him if he was taking medication. "I do," Dan answered, "but I don't have a problem with that. I'm just sick of this society." The officer gave him two citations, one for speeding and one for driving in the carpool lane, and then let him back on the road.

Dan said he didn't know he was manic-depressive until May 1993, during an episode that began when he made a trans2 video he hoped would be shown on CNN. The network never aired the video, but Danman didn't know that then, and he flew to a design conference in Kobe, Japan, feeling "ramped up." At the conference he made a presentation and got so wired he couldn't sleep – ideas were invading his brain one after another after another. "It was like a convergence in your head," he said, imbibing the first of his two prelunch Bloody Marys. "Things start getting grandiose, and you think you're connected to God

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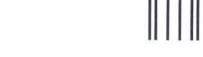
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### **Bitchin' Golf Cart**

◄ 272 colleagues' descriptions of his work habits suggest the ailment's influence in both positive and negative ways. On the one hand, Dan was unquestionably imaginative and infectiously energetic. However, he apparently was not only a brilliant designer but a maddeningly undisciplined one. His strength was conceptualizing. Indeed, so much of his work was drawn on envelopes and napkins that people at trans2 joked his office was the nearest Denny's. The trouble was that he liked conceptualizing much more than following up on his ideas, shepherding them through design, engineering, manufacturing, and marketing. As a result, the company suffered long delays while Danman indulged his creative whims. Query, a former IBM man-ager who is also Dan's stepfather and longtime backer, became trans2's CEO partly because he could exert some control over Dan, but even his reach had limits. "Dan had no clock." Query said. "He could work 50 hours in a row without sleep, but the problem was that he'd spend 35 of those 50 hours on things he wanted to do. And because he had an absolute need to do them, they usually turned out to be really creative things. But it didn't help you get resolved an engineering problem that needed some design help, because he was off creating a marketing program for the Web. He had a lot of creative balls in the air."

Intriguingly, one characteristic of Dan's ailment is what *The Merck Manual of Diagnosis and Therapy* calls "geographic instability." The symptom seems particularly relevant in Dan's case, for even though he's married and has a 10-year-old stepson, during the last year he lived at home in Ann Arbor, Michigan, only one week a month. He spent the rest of his time shuttling between part-time jobs at the University of California, Davis, where he works for the Institute of Transportation Studies, and in Sunnyvale, California, where he is director of new mobility for frogdesign.

After his two Bloody Marys, Dan stopped drinking; he had a Coke with his airplane lunch. He drew a few pictures on napkins of a leafy planet Earth, and spent a lot of time staring out the window. He had already told me his design idea for facilitating passenger movement on and off airplanes: When a plane was ready for boarding, passengers would find their seats on a vast tongue-like cartridge extending outside the plane from its front; once loaded, the cartridge would retract into the plane. Now, having landed, we stood stooped near the back of our

plane, waiting for the passengers in front of us to debark. Dan said, "This is when you need my cartridge idea."

hat golf courses are to Palm Desert, The Walt Disney Company is to Celebration: the defining element, looming and faintly sinister. The town was carved out of a 27,000-acre swath of central Florida, the bulk of which Disney owns; some of that land is occupied by Epcot and the rest of Walt Disney World, while a 4,900-acre expanse was set aside for Celebration and opened for residents in 1996.

Danman was upbeat when we arrived in Celebration. He declared that the town "feels as right to me as the car I've put all my life into – and almost as incomplete." It was no wonder he felt so positive about the place: Celebration was meant to be both community-oriented and futuristic, a perfect breeding ground for NEVs, and executives from The Celebration Company, the Disney subsidiary that built the town, had worked with trans2 to promote the NEV concept. Among the accommodations to trans2 cars were special parking places downtown,

and cinema, among others. Then, with a nostalgic look backward, it surrounded these provocative monuments with houses that look like gingerbread, all built by designated contractors according to six prescribed styles - Classical, Victorian, Colonial Revival, Coastal, Mediterranean, and French - and painted in prescribed colors, mostly pastels. Since Johnson et al. followed none of these dictates, the clear implication was that only Great Architects were allowed to break rules. Unlike the Greats' designs, the residences resembled dollhouses, all hollow and ersatz. At the edge of downtown lies a manmade, perfectly arced lake, which I viewed while listening to a wordless and nearly demelodized version of 1980s androgyne Boy George's "Do You Really Want to Hurt Me" through the Muzak speakers all around. As a name for the town, Celebration struck me as profoundly premature at best.

Yet Celebration has done many things right. Most strikingly, it embraced the credo of New Urbanism, the movement that two years ago was labeled by *New York Times* architecture critic Herbert Muschamp "the most important phe-

## Danman liked what he saw when he cruised into Celebration: "It feels as right to me as the car I've put all my life into — and almost as incomplete."

speed-limit reductions on main roads to 30 mph, and signs around town saying, "This is a Neighborhood Electric Vehicle community." With Disney's help, trans2 even won approval of a NEV resolution that disqualified its chief competitor, the Bombardier, by defining NEVs as vehicles with brakes on all four wheels (the Bombardier has brakes on only two wheels). It apparently was disposed to favor trans2 at least partially because Disney was once entangled in a legal dispute with Bombardier over the Disney World monorail and had no desire to promote Bombardier products. Only with the federal rule in June was the resolution overridden, at last allowing Bombardiers into Celebration.

Alas, Celebration proved to be the most backward-looking futuristic town imaginable. In a seeming nod toward the future, Disney commissioned some of the world's most celebrated architects – Philip Johnson, Robert Venturi, Michael Graves, Charles Moore, Cesar Pelli, and Robert A. M. Stern – to design Celebration's landmark buildings: the town hall, post office, nomenon to emerge in American architecture in the post-Cold War era." New Urbanists want to revitalize living spaces by resisting suburban sprawl and supporting compact, pedestrianfriendly, mixed-use neighborhoods. Celebration embodies an array of New Urbanist tenets, among them that homes are built close to the street, in many cases with wide front porches that promote neighborliness. Streets are narrow and garages are generally located behind houses, so cars' impact is minimal. The town center is in walking distance of most homes. All this has helped make Celebration residents feel they're part of a close-knit community. Some, such as Joseph Judge, who sells GEMs and runs a downtown bicycle and electric-vehicle shop, say they know far more neighbors than in places they've lived in the past.

The other distinguishing trait of Celebration is its esteem for technology. All residents get email addresses and admission to the Celebration Community Network, which provides a computer bulletin board, discussion groups, Internet 274 >

### **Bitchin' Golf Cart**

◄ 273 access, and links to the town's health center and school. Residents can manage their health records and make medical appointments on the network; on days when, say, the pollen count is high, the health center sends email to allergic patients reminding them to take their medication.

Celebration's planners thought NEVs fit their high tech mind-set. Yet NEVs have so far made only a modest impact in Celebration: Judge, the electric-vehicle dealer, pegs the number of NEVs in town at 18.

Danman would be glad to see NEVs' future hitched to the growth of New Urbanist communities, particularly since the movement already counts 200 projects that follow its tenets. But the link is tenuous. Some New Urbanists think NEVs can help them shift societal emphasis away from conventional cars; others think one thing better than NEVs is no cars at all. A few, such as James Howard Kunstler, a New Urbanist writer, bear animosity toward electric cars in general. In Home From Nowhere: Remaking Our Everyday World for the Twenty-First Century, Kunstler says that because an electric car uses energy generated at a power plant, "It is like the old joke about the guy who decides to make his blanket longer by cutting off 12 inches from the top and sewing it onto the bottom" - the pollution is merely displaced, spewed from a power plant instead of a tailpipe. There's a germ of truth in

local distributor for GEM, Judge refused to contact owners of the rival Bombardier. So Dan was already mumbling about Judge when Judge, a former police officer, told him that sheriff's deputies had spotted us driving our unlicensed Bombardier and had asked about our identity. Dan said Judge told him we were lucky he hadn't turned us in. The next day, Dan invited a 15-year-old Celebration resident to take our Bombardier for a spin, and Judge berated him for that, too. Danman told me he'd gotten so frustrated he'd pointed his finger in Judge's face and proclaimed that if he hadn't broken rules, the trans2 never would have been built to begin with. After that, Dan said, he was ready to leave Celebration.

But Danman still had a mission, and on Day Five, just before we left Celebration, he accomplished it. Since there's no appreciable demand for NEVs, Dan believes he must conduct an education campaign, explaining the benefits of NEVs to officials and consumers around the country. He defines "consumers" broadly: Since the fight for NEVs will be long-term, he considers children "a huge resource" for developing NEV markets and places high value on showing NEVs at schools. On this day he had arranged to talk to a group of 12- to 17-year-old students who had been spending the summer working on computers at the Celebration school. The first time we dropped by the school, Dan couldn't find the kids, but an hour later he rounded up seven in the school parking lot and showed them the Bombardier.

## Do you want to get rich, Dan asked a bunch of Florida kids, or save the world? The answer: "I want the cash, man."

Kunstler's assertion, but not much more than that. Electric cars do displace pollution, but only slightly: In a 1994 study, the Union of Concerned Scientists found that switching from gasoline to electric vehicles in the Los Angeles region would cause a 99 percent overall reduction of criteria pollutant emissions per vehicle.

Despite Dan's enthusiasm for Celebration, we kept running into snags. Once more he'd managed to obtain a Bombardier for our use, but recharging outlets weren't easy to find at our hotel. Dan finally drove the car onto a sidewalk to get it close enough to one. And Danman found himself entangled in the old trans2-Bombardier fight. Dan asked Judge to help round up all the town's NEVs for a group photo, but as the

Danman's only prop was chalk. He drew an outline of the Bombardier on the asphalt, then handed chalk to the kids and asked them to write their names.

"What's the biggest problem here?" he asked. A boy answered, "Too many tourists."

"So we charge tourists so we can buy NEVs, right?"

The kids didn't respond, so Dan changed his tack."When you grow up, do you want to be rich, or do you want to make the world a better place?"

"I want the cash, man," a small boy said.

Dan maneuvered the conversation back to NEVs. What, he wanted to know, were the kids' ideas for improving NEVs? He got all kinds of answers, starting with practical suggestions: Make NEVs bigger! Give them more speed! Make them safer and give them doors and put in a stereo system and a coffee machine! The NEV was turning into a regular car! Dan seemed not to notice. He was too busy writing the kids' ideas on the asphalt, and sometimes when he spoke, his eyes were closed.

Dan brought up all his core ideas, from his "kid NEV" program (13- to 16-year-olds would drive NEVs on city streets as preparation for driving conventional cars) to his notion that every community's NEV should be different, to reflect local conditions. Futuristic ideas involving technology, like Dan's whimsical floating-NEV suggestion – "When you get tired of this town, you push a button and your car floats to the next town and you settle there, like on a lily pad" – got a lot of response; environmental ideas got less. Dan repeated his joke about the 85-year-old attempting suicide. The kids didn't get it.

After 15 minutes in the midday heat, Dan offered rides in the Bombardier to anyone who wanted them, and I became the designated driver. The only volunteer was a boy who looked about 13. He called the presentation "pretty cool." When I asked him why, he had a quick answer: "kid NEVs."

fter Palm Desert and Celebration, South Bass lsland was a lark. We'd flown sans luggage to Cleveland, made our 2 a.m. toothbrush stop at a department store called Meijer (where Dan, upon noticing the broad front door, said, "One day you'll be able to drive NEVs right in here!"), and spent the night in Port Clinton, on the shore of Lake Erie. The next morning, joined by Dan's wife, Sonya, and two of their friends, we took a 22-minute jet catamaran ride to Put-in-Bay, the town that occupies most of the 31/2-mile-long island. It's a party island, plain and simple: The tourists who ferry there each summer day swell its population from its winter level of 450 up into the thousands and are notably interested in consuming alcohol. To help accommodate them, the island even has a 405-foot 10-inch, 160-stool bar, touted as the world's longest.

Maybe the island was the logical extension of where we'd already been, a place at last where electric vehicles reigned – but only in the way that the Marx Brothers ruled Freedonia. The island was home to about 800 standard golf carts, eight trans2s, and a few odd hybrids such as wedge-shaped, circa-'70s electric commuter cars, stretch-golf carts, and golf carts with monster wheels. The battered trans2s still in use looked like geese amid a flock of squab-

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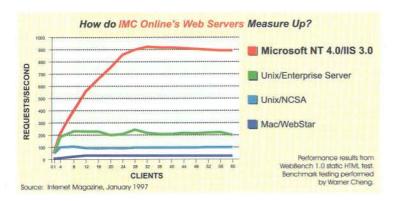
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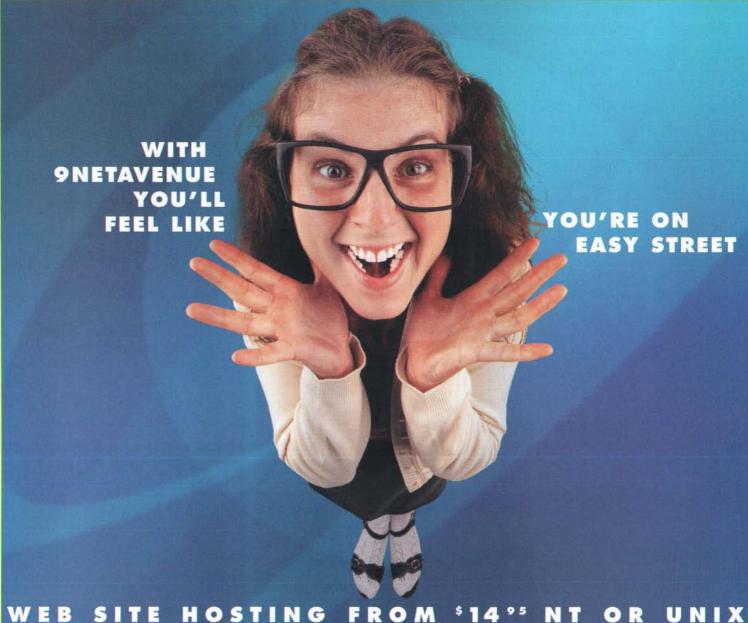


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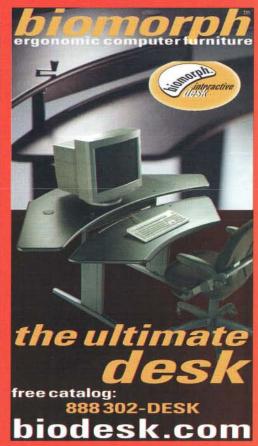




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### Software

Wordprocessing and tracking: Microsoft Office 98.

Page layout and illustration: QuarkXPress; Adobe Illustrator,
Dimensions, and Photoshop; Macromedia Fontographer.

Typography: Text: Adobe Myriad and Wiredbaum.

Heds: Adobe, FontShop, [T-26], House Industries, FUSE,
Hoefler Type Foundry.

**Graphics support:** Adobe Premiere; miroMOTION DC30; Equilibrium Technologies DeBabelizer.

Networking: Cisco enterprise routers and switches; 3Com hubs; Apple Work Group Servers with AppleShare IP; Shiva LanRover/E Plus; Sagem ISDN terminal adapters; 3Com external and PC card modems; Dantz Retrospect 4.0; Farallon Timbuktu Pro 4.7; Qualcomm Eudora Pro 4.1; Neon Software's CyberGauge 2.0.3; Dartmouth College's Intermapper 2.1; Sustainable Softworks' IPNetMonitor 2.1; Peter Lewis's Anarchie 3.0; InTrec Software ProTerm 1.2.5; AG Group's EtherPeek 3.5.2; Jim Matthews's Fetch 3.0.3; Microsoft Internet Explorer 4.0.1; Netscape 4.0.7.

### Electronic prepress and printing by Quad/Graphics Inc., Saratoga Springs, New York.

Color separations are made on a Linotype-Hell ChromaGraph S3900. Initial color corrections are performed on a Scitex Rightouch and proofed on the paper stock using a Kodak Approval digital color-proofing system. Additional electronic prepress is performed in-house at *Wired* using scans from the S3900; Agfa SelectScan Plus, Arcus II, and Vision 35 scanners; and Kodak PhotoCD. Composed pages are converted to PostScript through a PS2 and translated into Scitex language using software version 4.12. RIP'd files are sent to Scitex Prisma workstations. Composed digital proofs are submitted for final approval. Final graphic images and text are electronically imposed using a Creo Thermal Platesetter 3244. Printed on multiple Heidelberg Harris M-1000B web presses and bound on a Heidelberg Harris Falcon 232 Perfect Binder.

Printed on paper from Blandin and Inter Lake Papers. Cover; 80#/8 Lithoweb Dull Cover; Text: 40# Intrepid LoGlare.

Catherine Huchting; The Book of Disquiet, by Fernando Pessoa;

Thia's crab cakes; Maker's Mark Manhattans; penicillin; The

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### **Bitchin' Golf Cart**

◄ 274 bling chickens. Together with the golf carts, they far outnumbered the island's few conventional cars, and disproved the theory that small electric vehicles mean uncongested streets. By midday, Chan Stevens, a ka Gumby, proprietor of Bay Carts, had rented out all 200 of his electric vehicles to tourists, and the other cart rental shops were sold out, too: It was an island of bumper cars. Some drivers became quite inebriated. "When the drunks get hold of rental carts, there are all sorts of problems," Gumby said. "We need something simple that will hold together for them."

Unfortunately, this ruled out the dozen factory-recall trans2s he had purchased at a discount and reconditioned. He thought trans2s were great for private owners, but too complicated to stand up to drunks. Danman listened impassively as Gumby listed the problems he'd had with trans2s: Their range was shorter than a golf cart's, the battery chargers didn't hold up, the ignition systems had to be replaced because trans2 keys weren't duplicable and drunks often

Motors itself ordered six stretch carts to transport executives through factories. One of Gumby's trans2s was even used as a sleigh for a shopping mall Santa Claus. Shopping centers are potentially big NEV markets, Gumby thinks. NEVs would make excellent security vehicles, enabling security personnel to patrol parking lots and garages in near silence, and they could transport package-laden customers from stores to their cars. All their promise aside, he says the trouble with electric vehicles is that they lack the range to run all day without recharging. When they can do that, Gumby thinks, sales will soar. Gumby himself is working on a neat transitional solution, developing a rolling pack of charged batteries that can be quickly installed in a NEV when its initial set of batteries gets low.

South Bass Island, it soon became clear, didn't hold the key to NEVs' future. Instead, it seemed like a zany dead end. We talked to Mary Sutphin, a diabetic 74-year-old six-month-per-year resident who took a liking to electric vehicles because she can't walk far, and they offer a sensible way of getting around. Sutphin owns two electric

## Electric vehicles reigned on South Bass Island — in the way the Marx Brothers ruled Freedonia. It was an island of bumper cars.

lost them. On the other hand, a tree once fell on a row of Gumby's vehicles, and the only damage to the trans2s was a broken windshield, while the golf carts got flattened. The Sturgster called this "one of the most striking comments" he had heard on the trip.

Gumby likes NEVs; in fact, he likes all electric cars. He's an animated and cheerful man of 65 whose solid bulk, silky white hair, and green coveralls suggest a mountain that is forested at the lower elevations and snow-covered at the summit.

Gumby and his mechanics are constant tinkerers, perpetually adding batteries to the golf carts or turning two-seaters into four- and sixseat vehicles. His fleet now includes such oddities as golf carts with Mustang grilles and 25-inch wheels.

Gumby has expanded the business to the mainland, where there is a growing demand for special-purpose electric vehicles; indeed, he thinks that in a couple of years his special-purpose business will grow larger than his rental enterprise on South Bass Island. Gumby's carts already have transported disabled fans between cars and football stadiums on game days. General

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vehicles. One is a late-1960s Harley Davidson golf cart with the word "MINE" spelled out in large letters across the rear panel – signifying her response to tourists who ask if the cart is for rent. The other vehicle is a 1996 trans2, which as we arrived was being taken for a spin by a few of the 64 relatives attending an ongoing Sutphin family reunion. Sutphin doesn't drive the trans2 much anymore, she says, but when she does, kids on the street yell, "Oh cool, lady!"

Danman liked that, I think, but it was getting harder to tell. With the end of the trip nearing, his attention for the first time was wavering. By the afternoon, Sonya was sitting next to him inside his rented trans2, and once I saw him with his arm around her. Considering that she had just told me how Dan's work was "24 hours a day – there's nothing else," I thought this was noteworthy. But a few days later, I received another Dan packet in the mail, and then another one several days after that. It was obvious that Danman was back in his bubble, floating, searching for a place with calmed traffic, neighborly cars, and an array of transportation options.



### **Beyond Digital**

ometimes defining the spirit of an age can be as simple as a single word. You may remember, for instance, the succinct (if somewhat cryptic) career advice given to young Benjamin Braddock, played by Dustin Hoffman, in the 1967 film *The Graduate*:

"Plastics."

"Exactly how do you mean?" asked Ben.

"There's a great future in plastics," replied Mr. McGuire. "Think about it. Will you think about it?"

Now that we're in that future, of course, plastics are no big deal. Is digital destined for the same banality? Certainly. Its literal form, the technology, is already beginning to be taken for granted, and its connotation will

The foothills of the future

And so? I know: Extrapolating bandwidth, processor speed, network dimensions, or the shrinking size of electromechanical devices has become truly tiresome. Moore's Law, first expounded by Gordon Moore in 1965, is indeed a stroke of brilliance, but one more mention of it should make you puke. Terabit access, petahertz processors, planetary networks, and disk drives on the heads of pins will be . . . they'll just be. Face it — the Digital Revolution is over.

Yes, we are now in a digital age, to whatever degree our culture, infrastructure, and economy (in that order) allow us. But the really surprising changes will be elsewhere, in our and will affect the planet profoundly: 1) global imperatives, 2) size polarities, 3) redefined time, 4) egalitarian energy, and 5) meaningless territory.

### Being global

As humans, we tend to be suspicious of those who do not look like us, dress like us, or act like us, because our immediate field of vision includes people more or less like us. In the future, communities formed by ideas will be as strong as those formed by the forces of physical proximity. Kids will not know the meaning of nationalism.

Nations, as we know them today, will erode because they are neither big enough to be global nor small enough to be local. The evolutionary life of the nation-state will turn out to be far shorter than that of the pterodactyl. Local governance will abound. A united planet is certain, but when is not.

### Being big and small

All things digital get bigger and smaller at the same time — most things in the middle fall out. We'll see a rise in huge corporations, airplanes, hotels, and newspaper chains in parallel with growth in mom-and-pop companies, private planes, homespun inns, and newsletters written about interests most of us did not even know humans have.

The only value in being big in any corporate sense will be the ability to lose billions of dollars before making them.

### Being prime

Prime time will be my time. We'll all live very asynchronous lives, in far less lockstep obedience to each other. Any store that is not open 24 hours will be noncompetitive. The idea that we collectively rush off to watch a television program at 9:00 p.m. will be nothing less than goofy. It will make sense only for sporting events

and election results – and that is only because people are betting.

The true luxury in life is to not set an alarm clock and to stay in pajamas as long as you like. From this follows a complete renaissance of rural living. In the distant future, the need for cities will disappear.

### Being equal

The caste system is an artifact of the world of atoms. Even dogs seem to know that on the Net.

Childhood and old age will be redefined. Children will become more active players, learning by doing and teaching, not just being seen and not heard. Retirement will disappear as a concept, and productive lives will be increased by all measures, most important those of self. Your achievements and contributions will come from their own value.

### Being unterritorial

Sovereignty is about land. A lot of killing goes on for reasons that do not make sense in a world where landlords will be far less important than webmasters. We'll be drawing our lines in cyberspace, not in the sand. Already today, belonging to a digital culture binds people more strongly than the territorial adhesives of geography — if all parties are truly digital.

Ask yourself about the basics, about water, air, and fire. Remember the game 20 Questions? You begin by giving a hint as to whether you are thinking of an animal, a vegetable, or a mineral. OK. I am thinking of none of them. I am thinking of 100111100010110001.

Next: After six years of writing the back page, I have decided it is time to pass this prime real estate on to someone else, before I find myself on the wrong side of the Wired/Tired equation. I won't be gone too far and will appear at times in this and other parts of the magazine. Promise.

Face it – the Digital Revolution is over.

Yes, we are now in a digital age,
but the really surprising changes
will be elsewhere.

become tomorrow's commercial and cultural compost for new ideas. Like air and drinking water, being digital will be noticed only by its absence, not its presence.

The decades ahead will be a period of comprehending biotech, mastering nature, and realizing extraterrestrial travel, with DNA computers, microrobots, and nanotechnologies the main characters on the technological stage. Computers as we know them today will a) be boring, and b) disappear into things that are first and foremost something else: smart nails, self-cleaning shirts, driverless cars, therapeutic Barbie dolls, intelligent doorknobs that let the Federal Express man in and Fido out, but not 10 other dogs back in. Computers will be a sweeping yet invisible part of our everyday lives: We'll live in them, wear them, even eat them. A computer a day will keep the doctor away.

lifestyle and how we collectively manage ourselves on this planet.

Consider the term "horseless carriage." Blindered by what came before them, the inventors of the automobile could not see the huge change it would have on how we work and play, how we build and use cities, or how we derive new business models and create new derivative businesses. It was hard, in other words, to imagine a concept such as no-fault insurance in the days of the horse and buggy.

We have a similar blindness today, because we just cannot imagine a world in which our sense of identity and community truly cohabitates the real and virtual realms. We know that the higher we climb, the thinner the air, but we haven't experienced it — we're not even at digital base camp.

Looking forward, I see five forces of change that come from the digital age

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